WORKING CAPITAL ESTIMATES

Subject matter of this chapter

* To understand the subject matter of this chp, one should first understand the following —

B/s

Liability	Assets
Equity	Fixed Assets
	Current assets
Debt	* Raw material
	* W.I.P
Current Liability	* Finished goods
	* Debtors
	* Bank

* W.cap means ——

current assets – current liabilities

* In the balancesheet we will have assets namely
  - Fixed assets and
  - current assets namely ——
    * Raw material stock
    * work-in-progress stock
    * Finished goods stock
    * Debtors
    * Bank.
* All the assets are nothing but money in form of assets. Foregs
  a) we have a land worth ₹10crs. we call it property held as investment but one should understand blockage of ₹10crs money.
  b) we have 10kgs raw material of ₹10/kg in stock. we should understand that ₹100 money is blocked.

Therefore, one can conclude that all assets are nothing but fund that is blocked.

* To generate assets, we need to raise money from
  - Equity
  - Debt
  - current liability
* current assets is also called as "working capital" because, it is financed by both equity and also debt. Equity and debt put together is called as "capital". If that capital is used to fund day-to-day requirements like stock, we call it as, working capital.
* Every year, company will estimate its wcap requirement. Company has to maintain likely balance of raw material stock, debtors & cash bal. etc. That estimate will be made on the basis of sales. more the sales, more the current assets and vice versa.
* This w.cap is generally financed by the bank loans. Bank sanctions OD loans. For this bank asks for budget on w.cap.
* Thus, we need to budget raw material stock, w.i.p stock, FG's stock etc. we need to thus budget CA and CL.
* So, preparation of a w.cap estimate/ budget which is to be submitted to the bank is the subject matter of discussion in this chapter.
* Hence, we need to prepare a w.cap budget and submit to the bank, on the basis of which a certain % of budgeted amount will be given as a cash credit / w.cap Loan / O.D facility.

Notes

- since ICAI sm didnot provide enough ques on basics, we will first solve some self-made illustrations.

Raw material Valuation

Practical self made illustrations

1. Budgeted production = 60,000 units
   Rm consumption / unit = 2 kgs
   cost of RM = ₹4/kg
   Rm holding period = 2 months.

Solution:

material consumed = 60,000 units x 2 kgs
= 1,20,000 kgs.

stock of raw material required

company evenly maintains 2 months raw material in stock.

1,20,000 kgs ⟶ 12 ms
? ⟵ 2 ms
= 20,000 kgs

value of raw material stock

20,000 kgs x ₹4 = ₹80,000.

Formula

Raw material stock =

Annual consumption(Qty) x Purchase price x $\frac{\text{RM HP}}{12/365}$

= 1,20,000 kgs x ₹4 x $\frac{2}{12}$
= ₹80,000

meaning:

* All the numbers above are just estimates / budget.
* That means, company is estimated to consume 1,20,000 kgs of RM.
* company has to keep some amount of RM in stock. It is always left to the discretion of company's policy as to how much amount of stock of RM should be kept in warehouse. It is often expressed in terms of no. of months consumption. In the given question, it is 2 months consumption.
* If total consumption is 1,20,000 kgs p.a, for 2 months it is 20,000 kgs Assumed that RM

is evenly distributed through out the year.)

* So, company shall maintain that 20,000 kgs at all the times during the year as RM stock. For that we go for a bank loan. So, amount of loan company expect is 20,000 x 4 = ₹ 80,000. So, Co need to ₹ 80,000 capital to keep RM stock in the store room.

2. Estimated production = 60,000 units.
   RM cost / unit = ₹ 8/-
   stock period = 2 months.

Solution :

Alternative formula

material consumed (₹) x $\frac{\text{RM HP}}{12/365}$ = 60,000 U x 8 x 2/12
= ₹ 80,000

FG's valuation

3. Illustration on finished goods stock

Particulars	per unit
Raw materials	₹ 5
wages	₹ 4
manf. OH (incl depn ₹ 1)	₹ 3
Admn & selling expenses	₹ 3
Total cost p.u.	₹ 15

FG's holding period = 2 months.
production p.a (estimated) = 60,000 units
Calculate stock of FG's in following 3 cases
case 1 : when no information is given.
case 2 : stock valuation @ cash cost.
case 3 : stock valuation @ prime cost.

A. Solution - case 1:

* The company has decided to keep 2 months prod in stock of FGs.
* FG units = Annual prod (units) x $\frac{\text{RM HP}}{12}$
= 60,000 U x 2/12 = 10,000 U.

* FG's value = 10,000 U x ₹12 = ₹1,20,000.
Selling and Admn OH is not considered since it is incurred to sell FGs not to produce.

B. Solution – Case 2

* We donot need capital for funding non cash expenses because, they are not going to be spent.
* Therefore, non-cash items like depn should be excluded while calculating FGs value.

FGs value = 10,000 U x (₹12 - ₹1)
= ₹1,10,000

C. Solution – Case 3

* This model requires us to value FGs at prime cost.

FGs value = 10,000 U x (₹5 + ₹4)
= ₹90,000.

Notes

1. The FGs stock can be calculated as follows—

$$FGs = \text{Cost of production} \times \frac{FG\ HP}{12/365}$$

$$= \left[\begin{matrix}\text{No. of. units} \\ \text{produced}\end{matrix}\right] \times \begin{matrix}\text{cost} \\ \text{P.U}\end{matrix} \times \frac{FG\ HP}{12/365}$$

(OR)

$$FGs = \text{Cash COP} \times \frac{FG\ HP}{12/365}$$

(OR)

$$FGs = \text{Prime COP} \times \frac{FG\ HP}{12/365}.$$

W.I.P Valuation

4. W.I.P HP = 1/2 months. (Consider basic into from Q.3)

case-1:
W.I.P is 60% complete

case-2
W.I.P is 80% complete as to materials.
W.I.P is 60% complete as to wages.

Case-3: No info given.

Solve as per a) Total cost model b) Cash cost model.

Solution :-

Situation-1 - Total cost approach

Case 1: 60% complete

a. No. of units in W.I.P = Total production x WIPHP / 12/365

= 60,000 U x 0.5/12

= 2,500 units.

b. Calc of cost of W.I.P

Material	=	₹ 5 x 100%	= ₹ 5.00
Labour	=	₹ 4 x 60%	= ₹ 2.40
O.H	=	₹ 3 x 60%	= ₹ 1.80
			₹ 9.20

Total cost = ₹ 9.20 x 2,500 units = ₹ 23,000.

Case-2: Material 80% & Labour 60%

Material	=	₹ 5 x 80%	= ₹ 4.00
Labour	=	₹ 4 x 60%	= ₹ 2.40
O.H	=	₹ 3 x 60%	= ₹ 1.80
			₹ 8.20

Total cost = ₹ 8.20 x 2,500 units = ₹ 20,500.

Case-3: No info given.

Material	=	₹ 5 x 100%	= ₹ 5.00
Labour	=	₹ 4 x 50%	= ₹ 2.00
O.H	=	₹ 3 x 50%	= ₹ 1.50
			₹ 8.50

Total cost = ₹ 8.50 x 2,500 units = ₹ 21,250.

Notes

* When no info is given, we assume WIP to be 50% complete (ICAI assumption).
* But, material is always fed at the beginning of process, so it is always assumed as 100% complete unless specifically given in question.

Situation-2 – Cash cost approach

All calculations are same expect that replace ₹3 with ₹2 in OH calculation (excl depn)

Debtors valuation

5. Assume the same facts of Q.3,
   * Debt collection period = 2 months
   * Cash sales = 20%
   * SP = ₹20.

Solution:

Debtors (units) = 60,000 units × 2/12 → credit sales
= 10,000 units × 80% = 8,000 units

This 8,000 units if in godown, we call it FA's and if with customer, we call debtors.

a) Sales approach / Total approach:
DRs = 8,000 units × ₹20 = ₹1,60,000.

b) Total cost approach
DRs = 8,000 units × ₹15 = ₹1,20,000.

c) Cash cost approach
DRs = 8,000 units × ₹14 = ₹1,12,000.

Creditors valuation

6. Assume same facts of Q3, addl info ——
   * Credit period = 2ms
   * Cash purchases = 20%
   * Time lag for payment of expenses = 1month.

Calc CRs for RM and other expenses.

Solution:-

Creditors depends on purchases not on the consumption. If nothing is said otherwise, consumption = purchases.

a. CRs = Credit purchases × CP / 12/365 ← creditors for goods
= 60,000 units × ₹5 × 80% × 2/12
= ₹40,000.
↓ credit purchase.

b. Creditors for expenses

It is said that time lag is 1 month which means, always 1 month expense is outstanding. since RM creditors is already considered we will not consider it again. moreover, depn can't have creditors.

Expenses/unit = ₹4 + ₹2 + ₹3 = ₹9

Annual expenses = 60,000 units x 9

= ₹ 5,40,000.

Creditors for expenses = ₹ 5,40,000 x 1/12

= ₹ 45,000.

with this we have completed all items of current assets / w.capital.

7. Proposed production = 6,00,000 units.

Cost sheet summary

Particulars	Cost p.u.	Particulars	Cost p.u
Raw material	₹10.00	Total cost	₹20.00
Direct wages	₹ 2.50	profit	₹ 5.00
over heads	₹ 7.50	Selling price	₹ 25.00

(incl depn ₹0.25/u)

Other details

* Company holds 2 months RM stock.
* 1/2 months production in WIP stock.
* FG stock remain for 1 month.
* Creditor for material extend 1 month credit.
* Debtors – 2 months credit.
* minimum cash balance – ₹ 25,000.

Forecast the w.cap requirement.

Solution

P.T.O

Statement of working capital estimation

I. Total approach

Particulars	W.N	Amount(₹)
A. Current Assets		
(i) Raw material	1	10,00,000
(ii) W.I.P	2	3,75,000
(iii) Finished goods	3	10,00,000
(iv) Debtors	4	25,00,000
(v) Cash balance	5	25,000
Total.		49,00,000
B. Current Liabilities		
Creditors		5,00,000
C. working capital		
(A) - (B)		44,00,000

working notes :-

1. Raw material

Raw material = 6,00,000 units x 10 x 2/12
= ₹10,00,000

2. W.I.P

WIP (units) = $6,00,000 \times \frac{0.5}{12}$
= 25,000 units.

cost/unit

material	= 10x100%	= ₹10.00	Since nothing is said in the question it is assumed 50% completion for Lab & OH & mat @ 100%.
Labour	= 2.50x50%	= ₹1.25	
OH	= 7.50x50%	= ₹3.75	
		₹15.00	

WIP value (for financing)

25,000 units x ₹15 = ₹ 3,75,000

3. Finished goods

a. FG units = 6,00,000 units x 1/12
= 50,000 units.

b. Cost/unit

material	=	₹10.00
Labour	=	₹ 2.50
OH	=	₹ 7.50
Total	=	₹20.00

c. FG's value

50,000 units x ₹20 = ₹10,00,000.

4. Debtors

$$\text{Sales} \times \frac{DCP}{12}$$

= 6,00,000 units x ₹25 x 2/12
= ₹ 25,00,000

(OR)

units with customer = 6,00,000 U x 2/12
= 1,00,000

Dr value = 1,00,000 U x ₹25 = ₹ 25,00,000

5. Creditors

It is assumed that purchases = consumption and all purchases are credit purchases.

∴ credit purchases = 6,00,000 units x ₹ 10
= ₹ 60,00,000

$$\text{Creditors} = \text{Credit purchases} \times \frac{CPP}{12}$$

= ₹ 60,00,000 x 1/12
= ₹ 5,00,000

II. Cash cost approach (Indirect method)

1. W.Cap – total approach	=	₹ 44,00,000
2. Depn in W.I.P (25,000 U x 0.25 x 50%)	=	(₹ 3,125)
3. Depn in F.Gs (50,000 U x 0.25)	=	(₹ 12,500)

4. Depn in Dr = (₹ 25,000)
(1,00,000 x 0.25)

5. Profit in Dr = (₹ 5,00,000)
(1,00,000 UX 5)

w.cap = ₹ 38,59,375

8. **Comprehesive illustration** – Cash cost basis

a. Co : X Ltd
b. Gross profit margin : 20%.
c. Depn is part of COP.
d. Safety margin – 15%
e. Cash – 50% of current liabilities
f. No w.i.p
g. Stock of RM & FGs @ 1m holding.
h. Other info –

Particulars	Amount (₹)
Sales – 2m credit	27,00,000
materials consumed (2ms credit)	6,75,000
wages (paid 1st of next month)	5,40,000
manufacturing expenses payable at the end of year (Cash expenses–paid 1m arrears)	60,000
Admn expes (paid as above)	1,80,000
Sales promotion – paid quarterly & in advance	90,000

Solution :

Estimation of working capital

Particulars	W.N	Amount (₹)
A. Current Assets		
(i.) Raw material	1	56,250
(ii.) Finished goods	3, 4	1,61,250
(iii.) Debtors	5	3,67,500
(iv.) Pre-paid expense	6	22,500
(v.) Cash balance	10	1,16,250

Total.		₹1,23,750
B. Current liabilities		
(i) Creditors for goods	₹	1,12,500
(ii) O/s wages	8	45,000
(iii) O/s mant. exps	Given	60,000
(iv) O/s Admn. exps	9	15,000
Total		2,32,500
C. working capital (A) − (B)		4,91,250
D. Safety margin @15%		73,688
E. Total w.cap requirement (C) + (D)		5,64,938

working notes :

1. **Raw material :**

Raw material consumption(units) x Cost/unit x RM HP / 12m

(Cost/unit: given)

= ₹ 6,75,000 x 1/12 = ₹ 56,250.

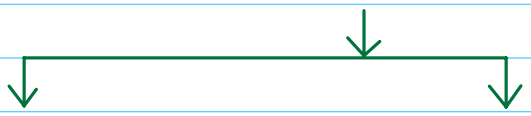
2. WIP : NIL

3. Before we do calculation of FGs stock we should analyse the sales and cost.

Analysis of sales & cost

Sales = ₹ 27,00,000

- COGS / COP: ₹ 21,60,000 (₹ 27,00,000 − ₹ 5,40,000)
  - materials: ₹ 6,75,000
  - labour: ₹ 5,40,000
  - overheads: 9,45,000 (bf)
- Gross profit: ₹ 5,40,000 (₹ 27,00,000 x 20%)



Cash OH	Depreciation
₹ 60,000 x 12m	(bal. fig)
= ₹ 7,20,000	= ₹ 2,25,000
	(₹ 9,45,000 − ₹ 7,20,000)

4. FGS stock

materials	=	₹ 6,75,000
(+) wages	=	₹ 5,40,000
(+) cash cost	=	₹ 7,20,000
cash COP	=	₹ 19,35,000

$$FGS = \text{cash COP} \times \frac{FG\ HP}{12}$$

= ₹ 19,35,000 x 1/12

= ₹ 1,61,250

5. Valuation of DRs

Cash COP	=	₹ 19,35,000
+ Admn OH	=	₹ 1,80,000
+ Selling OH	=	₹ 90,000
Cash COS	=	₹ 22,05,000

$$DRs = \text{Cash COS} \times \frac{DCP}{12}$$

= ₹ 22,05,000 x 2/12

= ₹ 3,67,500.

6. Pre-paid sales promotion expense

Pre-paid expense = 90,000 x 3/12

= ₹ 22,500.

7. Creditors for goods

$$\text{Creditors} = \text{Cr. pur} \times \frac{CPP}{12}$$

we assume that material consumed = material purchased and all purchases are purchased.

= ₹ 6,75,000 x 2/12 = ₹ 1,12,500

8. O/s wages

$$\text{Annual wages} \times \frac{\text{Time lag}}{12}$$

= ₹ 5,40,000 × 1/12

= ₹ 45,000

(OR)

Alternative for solving O/s wages

When wages are paid on the 1st of next month, the previous month's 1st day wages will be O/s for 1 month and last day wages will be O/s for 0 months. Hence, on an average, half a month wages is O/s.

O/s wages = ₹ 5,40,000 × $\frac{0.50}{12}$

= ₹ 22,500.

9. O/s Admn expense

O/s Admn expense = ₹ 1,80,000 × 1/12

= ₹ 15,000.

10. Cash balance

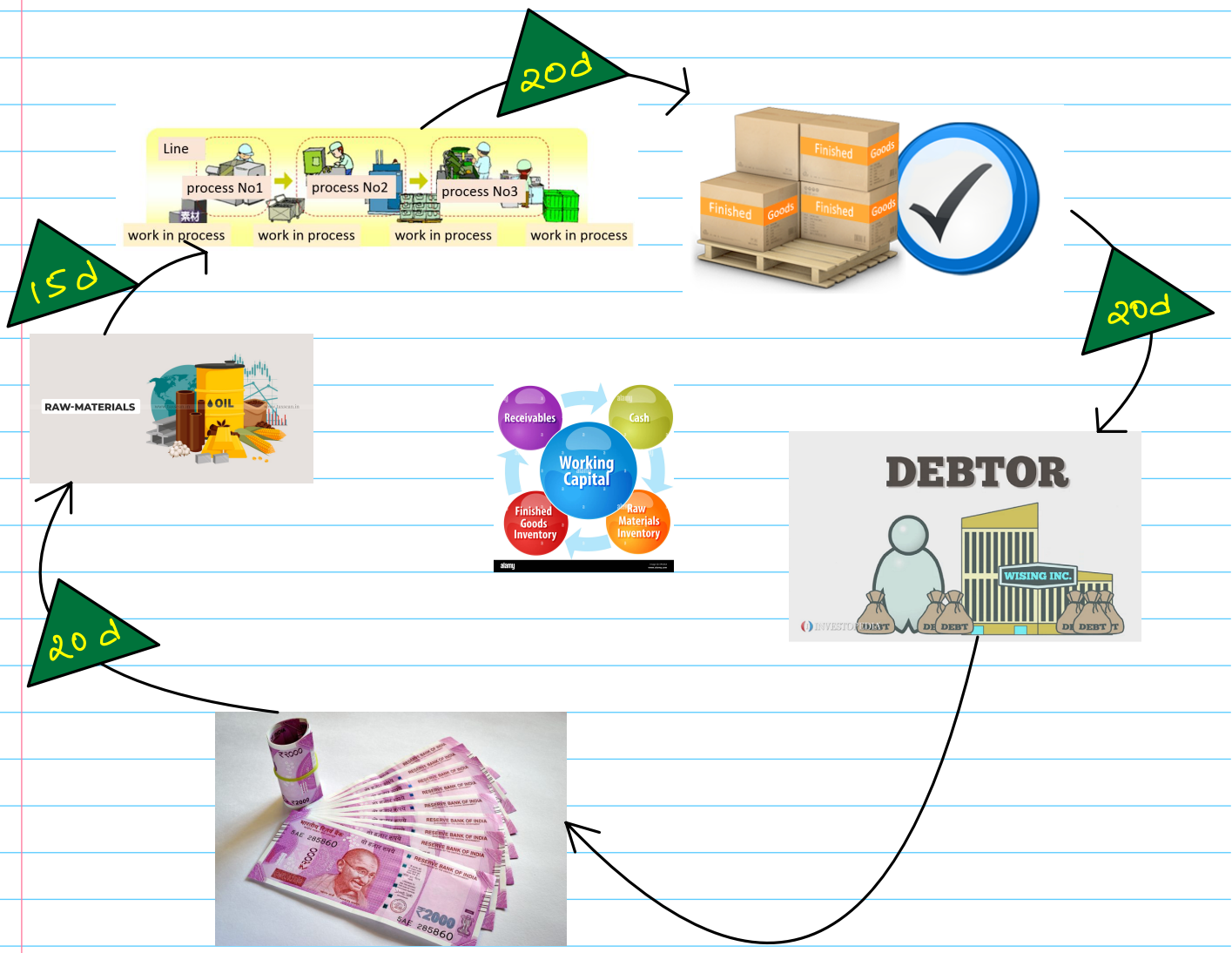
Cash balance is 50% of current liability. Therefore, we can't fill cash balance unless CL is known.

Cash balance = CL × 50%

= ₹ 2,32,500 × 50%

= ₹ 1,16,250

working capital cycle – Analysis



Notes :

* w·capital is not a stagnant capital but it is a fluctuating capital/ rotating capital. For eg, if we invest in land & building, the capital is locked in for so many number of years and same is not the case with w·capital.
* In case of working capital,
  - S1 we put some fund i·e· cash to start the operations· (essentially in raw materials)
  - S2 This raw material is not immediately consumed, but is kept in warehouse for days/months.

S3 Then that RM moves from stores to factory taking the shape of W.I.P where in we add other costs like labour and overheads.

S4 It will take some time to get converted into F.Gs and till then it stay as W.I.P stock and then on completion of production process, it becomes F.G and lay as stock of FGs since it cant be sold immediately- (sales promotion, publicity etc shall add)

S5 Then, we sell the goods where some sale is in cash and some on credit which then creates debtors who will be collected at a future time. If debtors pay money, it becomes cash and then entire cycle will again restart.

This is called as "W.cap cycle" or also called as "operating cycle".

so, the summary is, cash is blocked in various forms for some number of days. Therefore, company don't need finance for all 365 days, it actually require fund to finance the WC cycle because, after each cycle we get back the cash.

↓

In the above diagram, total cycle period is 75 days. That means, for the first 30 days Co. dont get any kind of cash-flow. Suppose if a company needs ₹20,00,000 p.a for 1 year of production, we need not go for full finance we need financing for WC cycle period. In this case it is ——

365 days ⟶ ₹20,00,000

75 days ⟶ ?

↓

₹4,10,959.

The amount invested i.e. ₹ 4110,959 will come back in 75 days and again reinvested. If the company reduces the cycle period more faster the collection is and lesser the financing.

Formulae

1. RM HP + WIP HP + FG HP + Debtors = Gross OP. cycle.

2. RM HP + WIP HP + FG HP + DCP − CPP − time lag = Net OP. cycle.

3. $RM\ HP = \frac{RM\ stock}{mat.\ cons} \times 12/365$

4. $FG\ HP = \frac{FG\ stock}{COP} \times 12/365$

5. $WIP\ HP = \frac{WIP\ stock}{COP} \times 12/365$

6. $DCP = \frac{Debtors}{Cr.\ sales} \times 12/365$

7. $CPP = \frac{Creditors}{Cr.\ purchases} \times 12/365$

8. $Time\ lag = \frac{O/s\ expense}{Annual\ expense} \times 12/365$

Notes

* Numerator can be either total/average and it depends on question in exam.
* 12 m (or) 365 also depends on type of question
* WIP calculation may use COP / Gross works cost depending on data given in question.

9. From the following data compute the op. cycle and comment on increase / decrease ——

₹ in 000's

Particulars	yr-1	yr-2
Stock of RM	20	27
Stock of WIP	14	18
Stock of FG	21	24
Purchases	96	135
COGS	140	180
Sales	160	200
Debtors	32	SD
Creditors	16	18

Consider 360 days in year.

Step 1: operating cycle for year-1

content	Formula	calculation
1. RM holding period	$\frac{\text{RM stock}}{\text{RM cons}} \times 360$	$\frac{20}{96} \times 360$
		= 75 days

(since, opg & clg RM is assumed as same RM cons = RM purchase)

2. WIP holding period	$\frac{\text{WIP stock}}{\text{COP}} \times 360$	$\frac{14}{140} \times 360$
		= 36 days.

(COGS = COP because, it is assumed that opg & clg FGs are same).

3. FGs holding period	$\frac{\text{FGs stock}}{\text{COGS}} \times 360$	$\frac{21}{140} \times 360$
		= 54 days.
4. Debt collection period	$\frac{\text{Debtors}}{\text{Cr. sales}} \times 360$	$\frac{32}{200} \times 360$
		= 72 days.
5. Cr. pyt period	$\frac{\text{creditors}}{\text{Purchases}} \times 360$	$\frac{16}{96} \times 360$
		= 60 days

working capital cycle

RMHP + WIPHP + FGHP + DCP − CPP

= 75 days + 36 days + 54 days + 72 days − 60 days

= 177 days.

Step 2: operating cycle for year −2

content	Formula	calculation
1. Rm holding period (Refer WN 1)	$\frac{\text{Avg stock}}{\text{Rm cons}} \times 360$	$\frac{23.5}{128} \times 360$ = 66 days
2. WIP holding period (Refer WN 2)	$\frac{\text{Avg WIP}}{\text{COP}} \times 360$	$\frac{16}{183} \times 360$ = 31 days.
3. FGs holding period (Refer WN 3)	$\frac{\text{Avg FGs}}{\text{COGS}} \times 360$	$\frac{22.50}{180} \times 360$ = 45 days.
4. Debt collection period (Refer WN 4)	$\frac{\text{Avg. Drs}}{\text{Cr. sales}} \times 360$	$\frac{41}{200} \times 360$ = 74 days.
5. Cr. Pyt period	$\frac{\text{Avg. Crs}}{\text{Purchases}} \times 360$	$\frac{17}{135} \times 360$ = 45 days

working notes

1. Avg stock & RM consumed

a. Avg stock = $\frac{\text{opst} + \text{clg.st}}{2} = \frac{20+27}{2} = 23.50$

b. material consumed = opst + purchases − cl.st

= 20 + 135 − 27

= 128

2. Avg WIP & COP

a. Avg WIP = $\frac{\text{op WIP} + \text{cl. WIP}}{2} = \frac{14+18}{2} = 16$

b. COP + Op. FGs − Cl. FGs = COGs
(b/f) (given) (given) (given)
COP + 21 − 24 = 180
COP = 183

3. Avg. FGs
$\frac{\text{OP FG} + \text{Clg FG}}{2} = \frac{21+24}{2} = 22.50$

4. Debt collection period. – All sales are assumed as credit.

$\text{Avg Debtors} = \frac{\text{Opg. Dr} + \text{Clg. Dr}}{2}$

$= \frac{32+50}{2} = 41.$

5. Credit payment period – All purchases are assumed as credit.

$\text{Avg creditors} = \frac{\text{OP Cr} + \text{Clg. Cr}}{2}$

$= \frac{16+18}{2} = 17.$

working capital cycle

RMHP + WIPHP + FGHP + DCP − CPP
= 66 days + 31 days + 45 days + 74 days − 45 days
= 171 days.