# CHAPTER 13

## Solved Problems

**P.13.8** A proforma cost sheet of a company provides the following particulars:

| *Particulars* | *Amount per unit* |
|---|---|
| Elements of cost: | |
| Raw materials | Rs 80 |
| Direct labour | 30 |
| Overhead | 60 |
| Total cost | 170 |
| Profit | 30 |
| Selling price | 200 |

The following further particulars are available:

Raw materials in stock, on average, one month; Materials in process (completion stage, 50 per cent), on average, half a month; Finished goods in stock, on average, one month.

Credit allowed by suppliers is one month; Credit allowed to debtors is two months; Average time-lag in payment of wages is 1.5 weeks and one month in overhead expenses; one-fourth of the output is sold against cash; cash in hand and at bank is desired to be mantained at Rs 3,65,000.

You are required to prepare a statement showing the working capital needed to finance a level of activity of 1,04,000 units of production. You may assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly. For calculation purposes, 4 weeks may be taken as equivalent to a month.

### Solution

**TABLE 13.2** Statement showing determination of net working capital

| | |
|---|---|
| **(A)** Current assets: | |
| (i) Stock of materials for 1 month: (1,04,000 × Rs 80 × 4/52) | Rs 6,40,000 |
| (ii) Work-in-progress for 0.5 month: | |
| (a) Material (1,04,000 × Rs 80 × 2/52) × 0.50 | 1,60,000 |
| (b) Labour (1,04,000 × Rs 30 × 2/52) × 0.50 | 60,000 |
| (c) Overheads (1,04,000 × Rs 60 × 2/52) × 0.50 | 1,20,000 |
| (iii) Finished goods for 1 month: (1,04,000 × Rs 170 × 4/52) | 13,60,000 |
| (iv) Debtors for 2 months (78,000 × Rs 170 × 8/52) | 20,40,000 |
| (v) Cash in hand and at bank | 3,65,000 |
| Total investments in current assets | 47,45,000 |
| **(B)** Current liabilities: | |
| (i) Creditors, 1 month's purchase of raw materials, (i.e. 1,04,000 × Rs.80 × 4/52) | 6,40,000 |
| (ii) Average time-lag in payment of expenses | |
| (a) Overheads (1,04,000 × Rs 60 × 4/52) | 4,80,000 |
| (b) Labour (1,04,000 × Rs 30 × 3/104) | 90,000 |
| Total estimate of current liabilities | 12,10,000 |
| **(C)** Net working capital = Current assets – Current liabilities (*A* – *B*) | 35,35,000 |

### Working Notes and Assumptions

(i) 26,000 units have been sold for cash. Therefore, credit sales pertain to 78,000 units only.
(ii) Year has 52 weeks.
(iii) All overheads are assumed to be variable. Presence of depreciation element in overheads will lower the working capital requirement.

**P.13.9** From the following information, extracted from the books of a manufacturing company, compute the operating cycle in days:

Period covered: 365 days Average period of credit allowed by suppliers, 16 days

Other data are as follows:

(*Rs '000*)

| | |
|---|---|
| Average debtors (outstanding) | 480 |
| Raw material consumption | 4,400 |
| Total production cost | 10,000 |
| Total cost of sales | 10,500 |
| Sales for the year | 16,000 |
| Value of average stock maintained: | |
| Raw material | 320 |
| Work-in-process | 350 |
| Finished goods | 260 |

**Solution**

**TABLE 13.7** Determination of operating cycle *(amount in '000)*

| | *Particulars* | *Days* |
|---|---|---|
| **(i)** | Raw material holding period (365 days × Rs 320/4,400) | 27 |
| **(ii)** | *Less:* Creditors payment period | (16) |
| **(iii)** | Work-in-process holding period (365 days × Rs 350/Rs 10,000) | 13 |
| **(iv)** | Finished goods holding period (365 days × Rs 260/Rs 10,000) | 9 |
| **(v)** | Debtors collection period (365 days × Rs 480/Rs 16,000) (sales given are assumed equal to credit sales) | 11 |
| Duration of operating cycle | | 44 |

**P.13.10** Foods Ltd is presently operating at 60 per cent level, producing 36,000 packets of snack foods and proposes to increase its capacity utilisation in the coming year by 33.33 per cent over the existing level of production. The following data has been supplied:

**(i)** Unit cost structure of the product at current level:

| | |
|---|---|
| Raw material | Rs 4 |
| Wages (variable) | 2 |
| Overheads (variable) | 2 |
| Fixed overhead | 1 |
| Profit | 3 |
| Selling price | 12 |

**(ii)** Raw materials will remain in stores for 1 month before being issued for production. Material will remain in process for further 1 month. Suppliers grant 3 months credit to the company.

**(iii)** Finished goods remain in godown for 1 month.

**(iv)** Debtors are allowed credit for 2 months.

**(v)** Average time-lag in wages and overhead payments is 1 month and these expenses accrue evenly throughout the production cycle.

**(vi)** No increase either in cost of inputs or selling price is envisaged.

Prepare a projected profitability statement and a statement showing working capital requirement at the new level, assuming that a minimum cash balance of Rs 19,500 has to be maintained.

**Solution**

**TABLE 13.10** Projected profitability statement at 80 per cent level of capacity (48,000 packets)

| | | |
|---|---|---|
| Sales revenue (48,000 × Rs 12) | | Rs 5,76,000 |
| *Less:* Cost of sales: | | |
| Raw material (48,000 × Rs 4) | Rs 1,92,000 | |
| Wages (48,000 × Rs 2) | 96,000 | |
| Overheads, variable (48,000 × Rs 2) | 96,000 | |
| Fixed overheads (48,000 × Rs 0.75) | 36,000@ | 4,20,000 |
| Profit | | 1,56,000 |

@It is assumed the total fixed overheads are Rs 36,000 (earlier Re 1 per unit was the absorption rate 36,000 × Re 1; at 48,000 units, per unit fixed overheads are Re 0,75).

**TABLE 13.11** Statement showing determinatison of net working capital at 48,000 packets

| | | |
|---|---|---|
| **(A)** Current assets: | | |
| (i) | Stock of raw materials (48,000 × Rs 4 × 1/12) | Rs 16,000 |
| (ii) | Work-in-process (48,000 × Rs 6.375* × 1/12) | 25,500 |
| (iii) | Finished goods (48,000 × Rs 8.75 × 1/12) | 35,000 |
| (iv) | Debtors (48,000 × Rs 8.75 × 2/12) | 70,000 |
| (v) | Cash | 19,500 |
| Total current assets | | 1,66,000 |
| **(B)** Current liabilities: | | |
| (i) | Creditors (48,000 × Rs 4 × 3/12) | 48,000 |
| (ii) | Wages (48,000 × Rs 2 × 1/12) | 8,000 |
| (iii) | Variable overheads (48,000 × Rs 2 × 1/12) | 8,000 |
| (iv) | Fixed overheads (48,000 × Re 0.75 × 1/12) | 3,000 |
| Total current liabilities | | 67,000 |
| **(C)** Net working capital (*A* – *B*) | | 99,000 |

*Material = Rs 4.0 + 50 per cent of other conversion costs (Rs 2 wages + Rs 2 variable overheads + Re 0.75 fixed overheads)

**Assumption:** Since wages and overhead expenses accrue evenly throughout the production cycle, it is assumed that they will be in process for half-a-month on an average. In other words, conversion costs will be 50 per cent. Fixed overheads are exclusive of depreciation.

**P.13.11** You are supplied with the following information in respect of XYZ Ltd for the ensuing year:

Production of the year, 69,000 units
Finished goods in store, 3 months
Raw material in store, 2 months' consumption
Production process, 1 month
Credit allowed by creditors, 2 months
Credit given to debtors, 3 months
Selling price per unit, Rs 50
Raw material, 50 per cent of selling price
Direct wages, 10 per cent of selling price
Manufacturing and administrative overheads, 16 per cent of selling price
Selling overheads, 4 per cent of selling price

There is a regular production and sales cycle and wages overheads accrue evenly. Wages are paid in the next month of accrual. Material is introduced in the beginning of the production cycle. You are required to ascertain its working capital requirement.

## Solution

Statement showing working capital requirement

| | | |
|---|---|---|
| **(A)** Current assets: | | |
| (i) | Raw material in store (69,000 × Rs 25 × 2/12) | Rs 2,87,500 |
| (ii) | Work-in-process (69,000 × Rs 31.5* × 1/12)<br>(*Material, Rs 25 + 0.50 × (Rs 5, Direct wages + Rs 8, Manufacturing and other administrative overheads) | 1,81,125 |
| (iii) | Finished goods in store (69,000 × Rs 38 × 3/12) | 6,55,500 |
| (iv) | Debtors (69,000 × Rs 40 × 3/12) | 6,90,000 |
| Total current assets | | 18,14,125 |
| **(B)** Current liabilities: | | |
| (i) | Creditors (69,000 × Rs 25 × 2/12) | 2,87,500 |
| (ii) | Wages (69,000 × Rs 5 × 1/12) | 28,750 |
| Total current liabilities | | 3,16,250 |
| **(C)** Net working capital (*A* – *B*) | | 14,97,875 |

**Assumptions:** (i) Conversion costs (wages, manufacturing and other administrative overheads) are assumed to be equivalent to 50 per cent to determine WIP (ii) sales are credit sales and equivalent to units produced (69,000).

**P.13.12** On April 1 of the current year, the board of directors of Dowell Ltd wishes to know the amount of working capital that will be required to meet the programme of activity they have planned for the year. The following information is available:

(i) Issued and paid-up capital, Rs 2,00,000.
(ii) 5% Debentures (secured on assets), Rs 50,000.
(iii) Fixed assets valued at Rs 1,25,000 on March 31 of the previous year.

(iv) Production during the previous year was 60,000 units; it is planned that this level of activity should be maintained during the present year.
(v) The expected ratios of cost to selling price are - raw materials 60 per cent, direct wages 10 per cent and overheads 20 per cent.
(vi) Raw materials are expected to remain in store for an average of two months before these are issued for production.
(vii) Each unit of production is expected to be in process for one month. Full unit of raw materials is required in the beginning of production.
(viii) Finished goods will stay in warehouse for approximately three months.
(ix) Creditors allow credit for 2 months from the date of delivery of raw materials.
(x) Credit allowed to debtors is 3 months from the date of dispatch.
(xi) Selling price per unit is Rs 5.
(xii) There is a regular production and sales cycle.

Prepare:
(a) working capital requirement forecast; and
(b) an estimated profit and loss account and balance sheet at the end of the year.

## Solution

(a) Forecast of working capital of Dowell Ltd

| | |
|---|---|
| **(A)** Current assets: | |
| (i) Raw materials (60,000 × Rs 3 × 2/12) | Rs 30,000 |
| (ii) Work-in-process (60,000 × Rs 3.75 × 1/12) | 18,750 |
| (Rs 3 material cost + 50 per cent of wages and overheads i.e., Rs 1.5) | |
| (iii) Finished goods (60,000 × Rs 4.5 × 3/12) | 67,500 |
| (iv) Debtors (60,000 × Rs 4.5 × 3/12) | 67,500 |
| Total current assets | 1,83,750 |
| (*Contd.*) | |
| **(B)** Current liabilities: Creditors (60,000 × Rs 3 × 2/12) | 30,000 |
| **(C)** Net working capital (*A – B*) | 1,53,750 |

(b) Projected profit and loss account of the current year

| | | |
|---|---|---|
| Sales revenue (60,000 × Rs 5) | | Rs 3,00,000 |
| *Less: Cost of sales*: | | |
| Raw material (0.60 × Rs 3,00,000) | Rs 1,80,000 | |
| Direct wages (0.10 × Rs 3,00,000) | 30,000 | |
| Overheads (0.20 × Rs 3,00,000) | 60,000 | 2,70,000 |
| *Less:* Interest (Rs 50,000 × 0.05) | | 2,500 |
| Profit | | 27,500 |

Projected balance sheet at the end of March 31, current year

| *Liabilities* | | *Assets* | |
|---|---|---|---|
| Share capital | Rs 2,00,000 | Fixed assets | Rs 1,25,000 |
| Reserves & surplus: | | Current assets: | |
| Profit of the current year | 27,500 | Raw material | 30,000 |
| Profit & loss A/c (balancing figure) | 8,750 | Work-in-progress | 18,750 |
| 5% Debentures | 50,000 | Finished goods | 67,500 |
| Creditors | 30,000 | Debtors at selling price | |
| | | (15,000 units × Rs 5) | 75,000 |
| | 3,16,250 | | 3,16,250 |

**P.13.13** A company is considering its working capital investment and financial policies for the next year. Estimated fixed assets and current liabilities for the next year are Rs 2.60 crore and Rs 2.34 crore respectively. Estimated sales and EBIT depend on current assets investment, particularly inventories and book-debt. The financial controller of the company is examining the following alternative working capital policies (Rs crore):

| *Working capital policy* | *Investment in current assets* | *Estimated sales* | *EBIT* |
|---|---|---|---|
| Conservative | 4.50 | 12.30 | 1.23 |
| Moderate | 3.90 | 11.50 | 1.15 |
| Aggressive | 2.60 | 10.00 | 1.00 |

After evaluating the working capital policy, the financial controller has advised the adoption of the moderate working capital policy. The company is now examining the use of long-term and short-term borrowings for financing its assets. The company will use Rs 2.50 crore of the equity funds. The corporate tax rate is 35 per cent. The company is considering the following debt alternatives:

| *Financing Policy* | *Short-term debt* | *Long-term debt* |
|---|---|---|
| Conservative | 0.54 | 1.12 |
| Moderate | 1.00 | 0.66 |
| Aggressive | 1.50 | 0.16 |
| Interest rate-Average (%) | 12 | 16 |

**Required:** (1) Working capital investment for each policy. (a) Net working capital position, (b) Rate of return, and (c) Current ratio

(2) Financing for each policy. (a) Net working capital position, (b) Rate of return on shareholder equity, and (c) Current ratio

## Solution

(1) Statement showing working capital investment under each policy

| | *Particulars* | *Working capital policy* | | |
|---|---|---|---|---|
| | | *Conservative* | *Moderate* | *Aggressive* |
| (A) | Current assets | 4.50 | 3.90 | 2.60 |
| (B) | Fixed assets | 2.60 | 2.60 | 2.60 |
| (C) | Total assets (A) + (B) | 7.10 | 6.50 | 5.20 |
| (D) | Current liabilities | 2.34 | 2.34 | 2.34 |
| (E) | Net worth (C) – (D) | 4.76 | 4.16 | 2.86 |
| (F) | Estimated sales | 12.30 | 11.50 | 10.00 |
| (G) | EBIT | 1.23 | 1.15 | 1.00 |
| (a) | Net working capital position (A) – (D) | 2.16 | 1.56 | 0.26 |
| (b) | Rate of return (G)/(C) (in per cent) | 17.3 | 17.7 | 19.2 |
| (c) | Current ratio (A)/(D) | 1.92 | 1.67 | 1.11 |

(2) Statement showing effect of financing under alternative financing policy

*(Rs in crores)*

| | *Particulars* | *Financing policy* | | |
|---|---|---|---|---|
| | | *Conservative* | *Moderate* | *Aggressive* |
| (A) | Current assets | 3.90 | 3.90 | 3.90 |
| (B) | Fixed assets | 2.60 | 2.60 | 2.60 |
| (C) | Total assets (A) + (B) | 6.50 | 6.50 | 6.50 |
| (D) | Current liabilities | 2.34 | 2.34 | 2.34 |
| (E) | Short-term debt | 0.54 | 1.00 | 1.50 |
| (F) | Long-term debt | 1.12 | 0.66 | 0.16 |
| (G) | Equity capital | 2.50 | 2.50 | 2.50 |
| | Total liabilities (D) + (E) + (F) + (G) | 6.50 | 6.50 | 6.50 |
| | Estimated sales | 11.50 | 11.50 | 11.50 |
| (H) | EBIT | 1.15 | 1.15 | 1.15 |
| (I) | *Less:* Interest on short-term debt [12% of (E)] | (0.06) | (0.12) | (0.18) |
| (J) | Interest on long-term debt [16% of (F)] | (0.18) | (0.11) | (0.03) |
| (K) | EBT [(H) – (I) – (J)] | 0.91 | 0.92 | 0.94 |
| (L) | *Less:* Taxes @ 35% | (0.32) | (0.32) | (0.33) |
| (M) | EAT [(K) – (L)] | 0.59 | 0.60 | 0.61 |
| (a) | Net working capital [(A) – (D) – (E)] | 1.02 | 0.56 | 0.06 |
| (b) | Rate of return on equity funds [(M)/(G)%] | 23.6% | 24% | 24.4% |
| (c) | Current ratio [(A)/(D) + (E)] | 1.35 | 1.17 | 1.02 |

## Review Questions

**13.12** The management of Gemini Ltd has called for a statement showing the working capital needed to finance a level of activity of 3,00,000 units of output for the year. The cost structure for the company's product, for the above mentioned activity level, is detailed below:

| | *Cost per unit* |
|---|---|

| | |
|---|---|
| Raw materials | Rs 20 |
| Direct labour | 5 |
| Overheads | 15 |
| Total cost | 40 |
| Profit | 10 |
| Selling price | 50 |

Past trends indicate that raw materials are held in stock, on an average, for two months.
Work-in-progress will approximate to half-a-month's production.
Finished goods remain in warehouse, on an average, for a month.
Suppliers of materials extend a month's credit. Two month's credit is normally allowed to debtors. A minimum cash balance of Rs 25,000 is expected to be maintained.
The production pattern is assumed to be even during the year.
Prepare the statement of working capital determination.

**13.13** A client of yours, Care Ltd, is about to commence a new business, and finance has been provided in respect of fixed assets. They have, however, asked you to advise the additional amount which they should make available for working capital.
They provide you with the following estimates for their first year and inform you that they have arranged on overdraft limit with their banker of Rs 1,50,000.

| | *Average period of credit* | *Estimate for the first year* |
|---|---|---|
| Purchase of materials | 6 weeks | Rs 26,00,000 |
| Wages | 1.5 weeks | 19,50,000 |
| *Overheads*: | | |
| Rent, etc. | 6 months | 1,00,000 |
| Directors and managers salaries | 1 month | 3,60,000 |
| Travellers' and office salaries | 2 weeks | 4,55,000 |
| Travellers' commission | 3 months | 2,00,000 |
| Other overheads | 2 months | 6,00,000 |
| Sales –cash | — | 1,40,000 |
| –credit | 7 weeks | 65,00,000 |
| Average amount of stocks and work-in-progress | — | 3,00,000 |
| Average amount of undrawn profits | | 3,10,000 |

Sales were made at an even rate for the year.
You are required to prepare from the above figures and information table for submission to your clients, giving an estimate of the average amount of working capital which they should provide. State your assumptions, if any, clearly.

**13.14** Hi-Tech Ltd plans to sell 30,000 units next year. The expected per unit cost of goods is as follows:

| | |
|---|---|
| Raw material | Rs 100 |
| Manufacturing expenses | 30 |
| Selling, administrative and financial expenses | 20 |
| Selling price | 200 |

The duration at various stages of the operating cycle is expected to be as follows:
Raw material stage, 2 months
Work-in-process stage, 1 month
Finished goods stage, 1/2 month
Debtors stage, 1 month
Assume the monthly sales level of 2,500 units. Calculate the investment in various current assets and estimate the gross working capital requirement if the desired cash balance is 5 per cent of the gross working capital requirements.

**13.15** Prepare an estimate of net working capital requirement for the WCM Ltd adding 10 per cent for contingencies from the information given below:
Estimated cost per unit of production Rs 170 includes raw materials Rs 80, direct labour Rs 30 and overheads (exclusive of depreciation) Rs 60. Selling price is Rs 200 per unit. Level of activity per annum 1,04,000 units. Raw material in stock: average 4 weeks; work-in-progress (assume 50 per cent completion stage): average 2 weeks; finished goods in stock: average 4 weeks; credit allowed by the suppliers: average 4 weeks; credit allowed to debtors: average 8 weeks; lag in payment of wages: average 1.5 week; and cash at bank is expected to be Rs 25,000.

You may assume that production is carried on evenly throughout the year (52 weeks) and wages and overheads accrue similarly. All sales are on credit basis only. You may state your assumptions, if any.

**13.16** Determine the working capital requirements from the following particulars:

| *Annual budget for:* | *Amount (Rs lakhs)* |
|---|---|
| Raw materials | 360 |
| Supplies and components | 120 |
| Manpower | 240 |
| Factory expenses | 60 |
| Administration | 90 |
| Sales | 1,190 |

You are given the following additional information:

(i) Stock-levels planned: Raw materials, 30 days, supplies and components, 90 days.
(ii) 50 per cent of the sales is for cash; for the remaining 20 days credit is normal.
(iii) Finished goods are held in stock for a period of 7 days before they are released for sale.
(iv) Goods remain in process for 5 days.
(v) The company enjoys 30 days credit facilities on 20 per cent of the purchases.
(vi) Cash/bank balances had been planned to be kept at the rate of half month's budgeted expenses.

You may make assumptions as considered necessary and relevant in this connection.

**13.17** M/s PQR Ltd have approached their bankers for their working capital requirement, who have agreed to sanction the same by retaining the margins as under:

| | |
|---|---|
| Raw material | 20 per cent |
| Stock-in-process | 30 |
| Finished goods | 25 |
| Debtors, net | 10 |

From the following projections for next year, you are required to work out:

(a) the working capital required by the company; and
(b) the working capital limits likely to be approved by bankers.

| Estimates for next year | |
|---|---|
| Annual sales | Rs 14,40,000 |
| Cost of production | 12,00,000 |
| Raw material purchases | 7,05,000 |
| Monthly expenditure | 25,000 |

Anticipated opening stock of raw materials: Rs.1,40,000:
Anticipated closing stock of raw materials: Rs.1,25,000
Inventory norms:

| | |
|---|---|
| Raw material | 2 months |
| Work-in-progress | 15 days |
| Finished goods | 1 month |

The firm enjoys a credit of 15 days on its purchases and allows one month credit on its supplies. On sales orders the company has received an advance of Rs 15,000. State your assumptions, if any.

**13.18** PQR Ltd sells goods in domestic market on a gross profit of 25 per cent, not counting depreciation as a part of the 'cost of goods sold'. Its estimates for next year are as follows:

| | *Amount (Rs in lakh)* |
|---|---|
| Sales—Home at one month's credit | 1,200 |
| Exports at 3 months' credit, selling price 10 per cent below home price | 540 |
| Materials used (suppliers extend 2 months' credit) | 450 |
| Wages paid, 1/2 month in arrears | 360 |
| Manufacturing expenses (cash) paid, one month's arrears | 540 |
| Depreciation on fixed assets | 60 |
| Administrative expenses, paid one month in arrears | 120 |
| Sales promotion expenses (payable quarterly—in advance) | 60 |
| Income—tax payable in 4 instalments of which one falls in the next financial year | 150 |

The company keeps one month's stock of each of raw materials and finished goods and believes in keeping Rs 20 lakh as cash.
Assuming a 15 per cent safety margin, ascertain the estimated working capital requirements of the company (Ignore work-in-process).

## Answers

**13.12** Rs 40,25,000.
**13.13** Rs 1,50,000.
**13.14** Rs 1,19,517.
**13.15** Rs 49,66,500.
**13.16** Rs 111.42 lakh.
**13.17** (a) Rs 3,35,625, (b) Rs 2,62,500.
**13.18** Rs 237.5 lakh.