ULTIMATE CA

CA Inter May 2024

FINANCIAL MANAGEMENT

IMPORTANT QUESTIONS

CA MOHNISH VORA (MVSIR)

CA Intermediate – May 2024

INDEX

FM Important Questions

Note-

Above questions are for revision purpose only & for last minute preparation of FM Exam. The questions will help in covering the most important concepts of whole syllabus.

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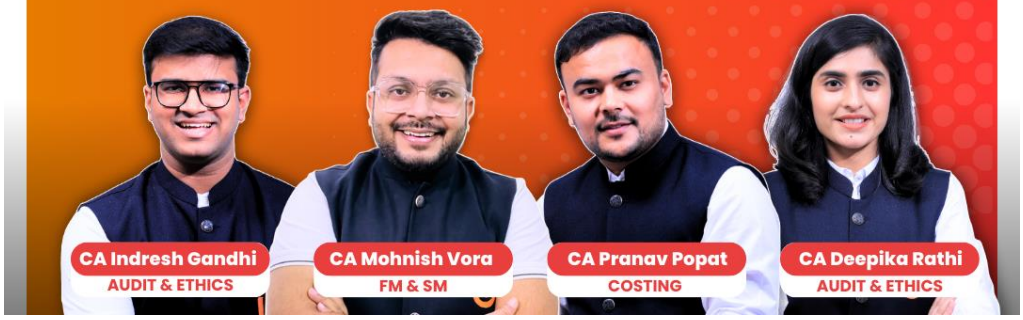

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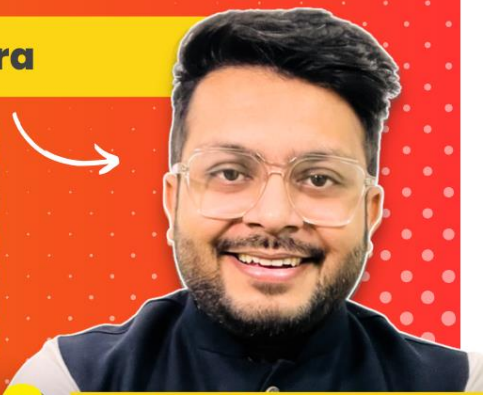
By **CA Mohnish Vora**



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CA Intermediate – May 2024
Financial Management

Chapter 3
Ratio Analysis

Important Questions

By CA Mohnish Vora (MVSIR)

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Question 1

ICAI SM

The capital structure of Beta Limited is as follows:

Equity share capital of Rs. 10 each	8,00,000
9% preference share capital of Rs. 10 each	3,00,000
	11,00,000

Additional information: Profit (after tax at 35 per cent) Rs. 2,70,000; Depreciation Rs. 60,000; Equity dividend paid 20 per cent; Market price of equity shares Rs. 40.

You are required to COMPUTE the following, showing the necessary workings:

a) Dividend yield on the equity shares

b) Cover for the preference and equity dividends

c) Earnings per shares

d) Price-earnings ratio

Solution 1

a) Dividend yield on the equity shares

$$= \frac{\text{Dividend per share}}{\text{Market price per share}} \times 100 = \frac{\text{Rs. 2 (i.e. 0.20 × Rs. 10)}}{\text{Rs. 40}} \times 100 = 5\%$$

b) Dividend coverage ratio

(i) Preference $= \dfrac{\text{Profit after taxes}}{\text{Dividend payable to preference shareholders}}$

$$\frac{\text{Rs. 2,70,000}}{\text{Rs. 27,000 (i.e. 0.09 × Rs. 3,00,000)}} = 10 \text{ times}$$

c)

(ii) Equity $= \dfrac{\text{Profit after taxes - Preference share dividend}}{\text{Divi payable to eq. shareholders at current rate of Rs. 2 per share}}$

$$\frac{\text{Rs. 2,70,000 – Rs. 27,000}}{\text{Rs.1,60,000 (i.e. 80,000 shares × Rs. 2)}} = 1.52 \text{ times}$$

Earnings per equity share $= \dfrac{\text{Earnings available to equity shareholders}}{\text{Number of equity shares outstanding}}$

$$\frac{\text{Rs. 2,43,000}}{80{,}000} = \text{Rs. 3.04 per share}$$

d) Price-earning (P/E) ratio $= \dfrac{\text{Market price per share}}{\text{Earnings per share}} = \dfrac{\text{Rs. 40}}{\text{Rs. 3.04}} = 13.2 \text{ times}$

Question 2

ICAI SM, RTP Nov 20, MTP Aug 18

Following information has been provided from the books of M/s Laxmi & Co. for the year ending on 31st March, 2020:

Net Working Capital	Rs. 4,80,000
Bank overdraft	Rs. 80,000
Fixed Assets to Proprietary ratio	0.75
Reserves and Surplus	Rs. 3,20,000
Current ratio	2.5
Liquid ratio (Quick Ratio)	1.5

You are required to PREPARE a summarised Balance Sheet as at 31st March, 2020.

Solution 2

Working notes:

i. Current Assets and Current Liabilities computation:

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{2.5}{1}$$

Or Current assets = 2.5 Current liabilities

Now, Working capital = Current assets - Current liabilities

Or Rs. 4,80,000 = 2.5 Current liability - Current liability

Or 1.5 Current liability = Rs. 4,80,000

Current Liabilities = Rs. 3,20,000

ii. **Computation of stock**

$$\text{Liquid ratio} = \frac{\text{Liquid assets}}{\text{Current liabilities}} = \frac{1.5}{1}$$

$$\text{Or } 1.5 = \frac{\text{Current Assets - Inventories}}{\text{Rs. 3,20,000}}$$

Or 1.5 x Rs. 3, 20,000 = Rs. 8,00,000 - Inventories

Or Inventories = Rs. 8,00,000 – Rs. 4, 80,000

Or Stock = Rs. 3,20,000

iii. **Computation of Proprietary fund; Fixed assets; Capital and Sundry creditors**

Fixed Asset to Proprietary ratio = $\frac{\text{Fixed assets}}{\text{Proprietary fund}}$ = 0.75

Fixed Assets = 0.75 Proprietary fund (PF) ……[FA+NWC = PF]

or NWC = PF- FA [(i.e. .75 PF)]

and Net Working Capital (NWC) = 0.25 Proprietary fund

Or Rs. 4,80,000/0.25 = Proprietary fund,

Thus, **Proprietary fund = Rs. 19,20,000**

Fixed Assets = 0.75 proprietary fund

= 0.75 x Rs. 19,20,000 = Rs. 14,40,000

Capital = Proprietary fund - Reserves & Surplus

= Rs. 19,20,000 - Rs. 3,20,000 = Rs. 16,00,000

Sundry Creditors = (Current liabilities - Bank overdraft)

= (Rs. 3,20,000 - Rs. 80,000) = Rs. 2,40,000

Equity and Liabilities	(Rs.)	Assets	(Rs.)
Capital	16,00,000	Fixed Assets	14,40,000
Reserves & Surplus	3,20,000	Stock	3,20,000
Bank overdraft	80,000	Other Current Assets	4,80,000
Sundry creditors	2,40,000		
	22,40,000		**22,40,000**

Question 3

ICAI SM, RTP May 22, MTP Oct 18

FM Ltd. is in a competitive market where every company offers credit. To maintain the competition, FM Ltd. sold all its goods on credit and simultaneously received the goods on credit. The company provides the following information relating to current financial year:

Debtors Velocity	3 months
Creditors Velocity	2 months
Stock Turnover Ratio (on Cost of Goods Sold)	1.5
Fixed Assets turnover Ratio (on Cost of Goods Sold)	4
Gross Profit Ratio	25%
Bills Receivables	Rs. 75,000
Bills Payables	Rs. 30,000
Gross Profit	Rs. 12,00,000

FM Ltd. has the tendency of maintaining extra stock of Rs. 30,000 at the end of the period than that at the beginning.

DETERMINE:

i. Sales and cost of goods sold
ii. Sundry Debtors
iii. Closing Stock
iv. Sundry Creditors
v. Fixed Assets

Solution 3

i. Determination of Sales and Cost of goods sold:

$$\text{Gross Profit Ratio} = \frac{\text{Gross profit}}{\text{Sales}} \times 100, \text{ or } \frac{25}{100} \quad \frac{\text{Rs. 12,00,000}}{\text{Sales}}$$

$$\text{Or, Sales} = \frac{\text{Rs. 12,00,000}}{25} = \text{Rs. 48,00,000}$$

Cost of Goods Sold = Sales – Gross Profit

= Rs. 48,00,000 – Rs. 12,00,000 = Rs. 36,00,000

ii. Determination of Sundry Debtors

Debtors' velocity is 3 months or Debtors' collection period is 3 months,

$$\text{So, Debtors' turnover ratio} = \frac{12 \text{ months}}{3 \text{ months}} = 4$$

$$\text{Debtors' turnover ratio} = \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$$

$$= \frac{\text{Rs. 48,00,000}}{\text{Bills Receivable + Sundry Debtors}} = 4$$

Or, Sundry Debtors + Bills receivable = Rs. 12,00,000

Sundry Debtors = Rs. 12,00,000 – Rs. 75,000 = Rs. 11,25,000

iii. Determination of Closing Stock

$$\text{Stock Turnover Ratio} = \frac{\text{Cost Of Goods Sold}}{\text{Average Stock}} = \frac{\text{Rs. 36,00,000}}{\text{Average Stock}} = 1.5$$

$$\frac{\text{Opening Stock + Closing Stock}}{2}, \text{Or } \frac{\text{Opening Stock + (Opening Stock + Rs. 30,000)}}{2}$$

= Rs. 24,00,000

Or 2 Opening Stock + Rs. 30,000= Rs.48,00,000

Or 2 Opening Stock = Rs.47,70,000

Or, Opening Stock = Rs. 23,85,000

So, Closing Stock = Rs. 23,85,000 + Rs. 30,000 = Rs. 24,15,000

iv. Determination of Sundry Creditors:

Creditors' velocity of 2 months or credit payment period is 2 months.

So, Creditors' turnover ratio = $\frac{12 \text{ months}}{2 \text{ months}} = 6$

$$\text{Creditors turnover ratio} = \frac{\text{Credit Purchases *}}{\text{Average Accounts Payables}}, \text{Or}$$

$$\frac{\text{Rs. 36,30,000}}{\text{Sundry Creditors + Bills Payables}} = 6$$

So, Sundry Creditors + Bills Payable = Rs. 6,05,000

Or, Sundry Creditors + Rs. 30,000 = Rs. 6,05,000

Or, Sundry Creditors = Rs. 5,75,000

v. Determination Of Fixed Assets

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Fixed Assets}} = 4$$

Or, $\frac{\text{Rs. 36,00,000}}{\text{Fixed Assets}} = 4$

Or, Fixed Asset = Rs. 9,00,000

Workings:

*Calculation of Credit Purchases:

Cost of goods sold = Opening stock + Purchases – Closing stock

Rs. 36,00,000 = Rs. 23,85,000 + Purchases – Rs. 24,15,000

Purchases (credit) = Rs. 36,30,000

Alternatively, Calculation of credit purchase also can be done as below:

Or Credit Purchases = Cost of goods sold + Difference in Opening Stock

Or Credit Purchases = 36,00,000 + 30,000 = Rs. 36,30,000

Question 4

MTP Nov 22, RTP May 20

MT Limited has the following Balance Sheet as on March 31, 2019 and March 31, 2020:

	Rs. in lakhs	
	March 31, 2019	March 31, 2020
Sources of Funds:		
Shareholders' Funds	2,500	2,500
Loan Funds	3,500	3,000
	6,000	5,500
Applications of Funds:		
Fixed Assets	3,500	3,000
Cash and bank	450	400
Receivables	1,400	1,100
Inventories	2,500	2,000
Other Current Assets	1,500	1,000
Less: Current Liabilities	(1,850)	(2,000)
	6,000	5,500

The Income Statement of the MT Ltd. for the year ended is as follows:

	Rs. in lakhs	
	March 31, 2019	March 31, 2020
Sales	22,500	23,800
Less: Cost of Goods sold	(20,860)	(21,100)
Gross Profit	**1,640**	**2,700**
Less: Selling, General and Administrative expenses	(1,100)	(1,750)
Earnings before Interest and Tax (EBIT)	540	950
Less: Interest Expense	(350)	(300)
Earnings before Tax (EBT)	190	650
Less: Tax	(57)	(195)
Profits after Tax (PAT)	133	455

Required:

CALCULATE for the year 2019-20-

a) Inventory turnover ratio

b) Financial Leverage

c. Return on Capital Employed (ROCE)

d. Return on Equity (ROE)

e. Average Collection period.

[Take 1 year = 365 days]

Solution 4

a. Inventory turnover ratio = $\frac{\text{COGS}}{\text{Average Inventory}} = \frac{\text{Rs. 21,100}}{\frac{\text{Rs.(2,500 + 2,000)}}{2}} = 9.4$

b. Financial leverage = $\frac{\text{EBIT}}{\text{EBT}} = \frac{950}{650} = 1.46$

c. ROCE = $\frac{\text{EBIT(1 – t)}}{\text{Average Capital employed}} \quad \frac{\text{Rs. 950(1 – 0.3)}}{\frac{\text{Rs.(6,000 + 5,500)}}{2}}$

$= \frac{\text{Rs. 665}}{\text{Rs. 5,750}} \times 100 = 11.56\ \%$

d. ROE = $\frac{\text{Profits after tax}}{\text{Average shareholders' funds}} = \frac{\text{Rs. 455}}{\text{Rs. 2,500}} \times 100 = 18.2\%$

e. Average Collection Period

Average Sales per day = $\frac{\text{Rs. 23,800}}{365}$ = Rs. 65.20 lakhs

Average collection period = $\frac{\text{Average Receivables}}{\text{Average sales per day}} = \frac{\frac{\text{Rs.(1,400+1,100)}}{2}}{\text{Rs. 65.2}} = 19.17$ days

Question 5

RTP May 21

Given below are the estimations for the next year by Niti Ltd.:

Particulars	(Rs. in crores)
Fixed Assets	5.20
Current Liabilities	4.68
Current Assets	7.80
Sales	23.00
EBIT	2.30

The company will issue equity funds of Rs. 5 crores in the next year. It is also considering the debt alternatives of Rs. 3.32 crores for financing the assets. The company wants to adopt one of the policies given below:

Financing Policy	Short term debt @ 12%	Long term debt @ 16%	Total
Conservative	1.08	2.24	3.32
Moderate	2.00	1.32	3.32
Aggressive	3.00	0.32	3.32

Assuming corporate tax rate at 30%, CALCULATE the following for each of the financing policy:

i. Return on total assets

ii. Return on owner's equity

iii. Net Working capital

iv. Current Ratio

Also advise which Financing policy should be adopted if the company wants high returns.

Solution 5

i. **Return on total assets** = $\frac{\text{EBIT (1 - T)}}{\text{Total assets (FA + CA)}}$

$= \frac{\text{Rs. 2.30 crores (1- 0.3)}}{\text{Rs. 5.20 crores + Rs. 7.80 crores}}$

$= \frac{\text{Rs. 1.61 crores}}{\text{Rs 13 crores}}$

= 0.1238 or 12.38%

ii. Return on owner's equity (Amount in Rs.)

	Financing policy (Rs.)		
	Conservative	Moderate	Aggressive
Expected EBIT	2,30,00,000	2,30,00,000	2,30,00,000
Less: Interest			
Short term Debt @ 12%	12,96,000	24,00,000	36,00,000
Long term Debt @ 16%	35,84,000	21,12,000	5,12,000
Earnings before tax (EBT)	1,81,20,000	1,84,88,000	1,88,88,000
Less: Tax @ 30%	54,36,000	55,46,400	56,66,400

Earnings after Tax (EAT)	1,26,84,000	1,29,41,600	1,32,21,600
Owner's Equity	5,00,00,000	5,00,00,000	5,00,00,000
Return on owner's equity $= \frac{\text{EBIT (1 - T)}}{\text{Total assets (FA + CA)}}$	$= \frac{1,26,84,000}{5,00,00,000}$ = 0.2537 or 25.37%	$= \frac{1,29,41,600}{5,00,00,000}$ = 0.2588 or 25.88%	$= \frac{1,32,21,600}{5,00,00,000}$ = 0.2644 or 26.44%

iii. Net Working capital (Rs. in crores)

	Financing policy (Rs.)		
	Conservative	**Moderate**	**Aggressive**
Current Liabilities (Excluding Short Term Debt)	4.68	4.68	4.68
Short term Debt	1.08	2.00	3.00
Total Current Liabilities	5.76	6.68	7.68
Current Assets	7.80	7.80	7.80
Net Working capital = Current Assets – Current Liabilities	7.80 - 5.76 = 2.04	7.80 - 6.68 = 1.12	7.80 - 7.68 = 0.12

iv. Current ratio

	Financing policy (Rs.)		
	Conservative	**Moderate**	**Aggressive**
Current Ratio $= \frac{\text{Current Assets}}{\text{Current Liabilities}}$	$= \frac{7.80}{5.76}$ = 1.35	$= \frac{7.80}{6.68}$ = 1.17	$= \frac{7.80}{7.68}$ = 1.02

Advise: It is advisable to adopt aggressive financial policy, if the company wants high return as the return on owner's equity is maximum in this policy i.e. 26.44%.

Question 6

MTP Apr 22, Newly added Que in ICAI SM of New Syllabus

From the following information, you are required to PREPARE a summarised Balance Sheet for Rudra Ltd. for the year ended 31st March, 2022

Debt Equity Ratio	1:1
Current Ratio	3:1
Acid Test Ratio	8:3
Fixed Asset Turnover (on the basis of sales)	4
Stock Turnover (on the basis of sales)	6
Cash in hand	5,00,000
Stock to Debtor	1:1
Sales to Net Worth	4
Capital to Reserve	1:2
Gross Profit	20% of Cost
COGS to Creditor	10:1

Interest for entire year is yet to be paid on Long Term loan @ 10%.

Solution 6

Balance Sheet of Rudra Ltd

Liabilities	Amount (Rs.)	Assets	Amount (Rs.)
Capital	10,00,000	Fixed Assets	30,00,000
Reserves	20,00,000	Current Assets:	
Long Term Loan @ 10%	30,00,000	Stock in Trade	20,00,000
Current Liabilities:		Debtors	20,00,000
Creditors	10,00,000	Cash	5,00,000
Other Short-term Current Liability (Other STCL)	2,00,000		
Outstanding Interest	3,00,000		
	75,00,000		**75,00,000**

Working Notes-

Balance Sheet of Rudra Ltd

Liabilities	Amount (Rs.)	Assets	Amount (Rs.)
Capital		Fixed Assets	x / 4
Reserves			
Net Worth	x / 4	Current Assets:	
Long Term Loan @ 10%	x / 4	Stock in Trade	x / 6
		Debtors	x / 6
Current Liabilities:		Cash	5,00,000
Creditors	x / 12		
Other Short-term Current Liability			
Outstanding Interest			
Total Current Liab.	x/9 + 500000/3		
Total		**Total**	

1. Fixed Asset Turnover = 4 = $\frac{x}{\text{Fixed assets}}$, Fixed Asset = $\frac{x}{4}$

2. Stock Turnover = 6 = $\frac{x}{\text{Stock}}$

   Stock = $\frac{x}{6}$

3. Sales to net worth = 4 = $\frac{x}{\text{New Worth}}$, Net worth = $\frac{x}{4}$

4. Debt: Equity = 1 : 1

5. Gross Profit to Cost = 20% ,

$$\frac{\text{Long Term Loan}}{\text{Net worth}} = \frac{1}{1}$$

$$\frac{GP}{\text{Sales - GP}} = 20\%$$

$$= \frac{GP}{x - GP} = 20\%$$

GP = 0.2 x – 0.2 GP , 1.2 GP = 0.2 x

GP = $\frac{0.2x}{1.2}$, GP = x/6

Cost of Goods Sold = x – x/6 = 5/6 x

6. COGS to creditors = 10:1

$$\frac{COGS}{Creditors} = \frac{10}{1}, \qquad \frac{\frac{5}{6}x}{Creditors} = \frac{10}{1}$$

$$Creditors = \frac{5x}{60} = \frac{x}{12}$$

7. $\frac{Stock}{Debtors} = 1$

Thus, Debtor = Stock = $\frac{x}{6}$

8. Current Ratio = 3 : 1, $\frac{Stock+Debtors + Cash}{Current\ Liabilities} = \frac{3}{1}$

$$\frac{\frac{x}{6} + \frac{x}{6} + 500{,}000}{Current\ Liabilities} = 3 = \frac{\frac{x}{3} + 500{,}000}{Current\ Liabilities} = CL$$

$$CL = \frac{x}{9} + \frac{5{,}00{,}000}{3}$$

9. $CA = 3CL$, $CA = 3\left(\frac{x}{9} + \frac{5{,}00{,}000}{3}\right)$, $CA = \frac{x}{3} + 5{,}00{,}000$

10. Net worth + Long Term Loan + Current Liability = Fixed Asset + Current Assets

$$\frac{x}{4} + \frac{x}{4} + \frac{x}{9} + \frac{5{,}00{,}000}{3} = \frac{x}{4} + \frac{x}{3} + 5{,}00{,}000$$

$$\frac{x}{4} + \frac{x}{9} - \frac{x}{3} = 5{,}00{,}000 - \frac{5{,}00{,}000}{3}$$

$$\frac{9x + 4x - 12x}{36} = \frac{15{,}00{,}000 - 5{,}00{,}000}{3}, \quad \frac{x}{36} = \frac{10{,}00{,}000}{3}$$

x = 1,20,00,000

11. Now, from above calculations, we get,

Fixed Asset = $\frac{x}{4} = \frac{1,20,00,000}{4}$ = 30,00,000

Stock = $\frac{x}{6} = \frac{1,20,00,000}{6}$ = 20,00,000

Debtor = $\frac{x}{6} = \frac{1,20,00,000}{6}$ = 20,00,000

Net Worth = x / 4 = 30,00,000

Now, Capital to Reserve is 1 : 2

Capital = Rs. 10,00,000

and, Reserve = Rs. 20,00,000

Long Term Loan = $\frac{x}{4}$ = 30,00,000

Outstanding Interest = 30,00,000 × 10% = 3,00,000

Creditors = $\frac{x}{12} = \frac{1,20,00,000}{12}$ = 10,00,000

Current Liabilities = Creditors + Other STCL + Outstanding Interest

$\frac{x}{9} = \frac{5,00,000}{3}$ = 10,00,000 + Other STCL + 3,00,000

$\frac{1,20,00,000}{9} + \frac{5,00,000}{3}$ = 13,00,000+ Other STCL

15,00,000 = Other STCL + 13,00,000 ,

Other STCL = 2,00,000

Question 7

MTP Oct 21

ABC Ltd. has total sales of 10,00,000 all of which are credit sales. It has a gross profit ratio of 25% and a current ratio of 2. The company's current liabilities are Rs 2,00,000. Further, it has inventories of Rs 80,000, marketable securities of Rs 50,000 and cash of Rs 30,000. From the above information:

1. CALCULATE the average inventory, if the expected inventory turnover ratio is three times?
2. Also CALCULATE the average collection period if the opening balance of debtors is expected to be Rs 1,50,000. Assume 360 days a year.

Solution 7

i. Calculation of Average Inventory Since gross profit is 25% of sales, the cost of goods sold should be 75% of the sales.

Cost of goods sold = 10,00,000 x 75 = 7,50,000

$$\text{Inventory Turnover} = \frac{\text{Cost of goods sold}}{\text{Average Inventory}}$$

$$3 = \frac{7,50,000}{\text{Average Inventory}}$$

$$\text{Average Inventory} = \frac{7,50,000}{3} = 2,50,000$$

ii. Calculation of Average Collection Period

$$\text{Average Collection Period} = \frac{\text{Average Debtors}}{\text{Credit Sales}} \times 360$$

$$\text{Where, Average Debtors} = \frac{\text{Opening Debtors + Closing Debtors}}{2}$$

Calculation of Closing balance of debtors

Now, Average Debtors

= (1,50,000 + 2,40,000) / 2

= 1,95,000

So, Average Collection Period

= (1,95,000 / 10,00,000) x 360

= 70.2 or 70 days

	Rs	Rs
Current Assets (2 x 2,00,000)		4,00,000
Less: Inventories	80,000	
Marketable Securities	50,000	
Cash	30,000	1,60,000
Debtors Closing Balance		**2,40,000**

Question 8

RTP May 23

From the following information, find out missing figures and REWRITE the balance sheet of Mukesh Enterprise.

Current Ratio = 2:1

Acid Test ratio = 3:2

Reserves and surplus = 20% of equity share capital

Long term debt = 45% of net worth

Stock turnover velocity = 1.5 months

Receivables turnover velocity = 2 months

You may assume closing Receivables as average Receivables.

Gross profit ratio = 20%

Sales is ₹ 21,00,000 (25% sales are on cash basis and balance on credit basis)

Closing stock is ₹40,000 more than opening stock.

Accumulated depreciation is 1/6 of original cost of fixed assets.

Balance sheet of the company is as follows:

Liabilities	(₹)	Assets	(₹)
Equity share capital	?	Fixed assets (cost)	?
Reserves and surplus	?	Less : Accumulated Depreciation	?
Long term loans	6,75,000	Fixed assets(WDV)	?
Bank overdraft	60,000	Stock	?
Creditors	?	Debtors	?
		Cash	?
Total	?	Total	?

Solution 8

Liabilities	(₹)	Assets	(₹)
Equity share capital	12,50,000	Fixed assets (cost)	20,58,000
Reserves and surplus	2,50,000	Less : Accumulated Depriciation	(3,43,000)
Long term loans	6,75,000	Fixed assets(WDV)	17,15,000
Bank overdraft	60,000	Stock	2,30,000
Creditors	4,00,000	Debtors	2,62,500
		Cash	4,27,500
Total	26,35,000	Total	26,35,000

Working note:

(i) Sales ₹ 21,00,000

less: Gross profit (20%) ₹ (4,20,000)

cost of goods sold ₹ 16,80,000

(ii) Receivables turnover velocity = $\frac{\text{Average receivables}}{\text{Credit Sales}} \times 12$

$2 = \frac{\text{Average Receivables}}{₹\ 21,00,000 \times 75\%} \times 12$

$\text{Average Receivables} = ₹\ \frac{21,00,000 \times 75\% \times 2}{12}$

Average Receivables = ₹ 2,62,500

Closing Receivables = ₹ 2,62,500

(iii) Stock turnover velocity = $\frac{\text{Average stock}}{\text{COGS}} \times 12$

$\text{or } 1.5 = \frac{\text{Average stock} \times 12}{₹\ 16,80,000}$

$\text{or Average stock} = \frac{₹\ 16,80,000 \times 1.5}{12}$

or Average Stock = ₹ 2,10,000

$\frac{\text{Opening Stock + Closing Stock}}{2} = ₹\ 2,10,000$

Opening Stock + Closing Stock = ₹ 4,20,000 .....(1)

Also , Closing Stock – Opening Stock = ₹ 40,000.....(2)

Solving (1) and (2) , we get **closing stock = ₹ 2,30,000**

(iv) Current ratio = $\frac{\text{current assets}}{\text{current liabilities}} = \frac{\text{stock + receivables + cash}}{\text{bank overdraft + creditors}}$

$\text{Or } 2 = \frac{₹\ 2,30,000 + ₹\ 2,62,500 + \text{cash}}{₹60,000 + \text{creditors}}$

or ₹1,20,000 + 2 creditors = ₹4,92,500 + cash

or 2 creditors – cash = ₹3,72,500

or cash = 2 creditors – ₹3,72,500.....(3)

Acid test ratio = $\frac{\text{current assets – stock}}{\text{current liabilities}} = \frac{\text{debtor + cash}}{\text{current liabilities}}$

or 3 = ₹ 2,62,500 + cash
2 ₹ 60,000 + creditors

Or ₹ 1,80,000 + 3 creditors = ₹ 5,25,000 + 2 cash

or 3 creditors - 2 cash = 3,45,000.....(4)

Substitute (3) in (4)

Or 3 creditors – 2 (2creditors – ₹ 3,72,500) = ₹ 3,45,000

Or 3 creditors - 4 creditors + ₹ 7,45,000 = ₹ 3,45,000

Creditors = ₹ 3,45,000 – ₹ 7,45,000

Creditors = ₹ 4,00,000

So, cash = 2 x ₹ 4,00,000 – ₹ 3,72,500

Cash = ₹ 4,27,500

(v) Long term Debt = 45% of Net Worth

Or ₹ 6,75,000 = 45% of Net Worth

Net Worth = ₹ 15,00,000

(vi) Equity Share Capital (ESC) + Reserves = ₹ 15,00,000

Or ESC + 0.2ESC = ₹ 15,00,000

Or 1.2 ESC = ₹ 15,00,000

Equity Share Capital (ESC) = ₹ 12,50,000

(vii) Reserves = 0.2 x ₹ 12,50,000

Reserves = ₹ 2,50,000

(viii) Total of Liabilities = Total of Assets

Or ₹ 12,50,000 + ₹ 2,50,000 + ₹ 6,75,000 + ₹ 60,000 + ₹ 4,00,000 + Fixed Assets (FA) (WDV) + ₹2,30,000 + ₹2,62,000 + ₹4,27,500

Or ₹26,35,000 = ₹ 9,20,000 + FA(WDV)

FA (WDV) = ₹17,15,000

Now FA(Cost) – Depreciation = FA(WDV)

Or FA(Cost) – FA(Cost)/6 = ₹ 17,15,000

Or 5 FA(Cost)/6 = ₹ 17,15,000

Or FA(Cost) = ₹ 17,15,000 x 6/5

So, FA(Cost) = ₹ 20,58,000

Depreciation = ₹ 20,58,000/6 = ₹ 3,43,000

Question 9

PYQ Nov 22

The following figures are related to the trading activities of M Ltd.

Total assets	₹ 10,00,000
Debt to total assets	50%
Interest cost	10% per year
Direct Cost	10 times of the interest cost
Operating Exp.	₹ 1,00,000

The goods are sold to customers at a margin of 50% on the direct cost

Tax Rate is 30%

You are required to calculate

(i) Net profit margin

(ii) Net operating profit margin

(iii) Return on assets

(iv) Return on owner's equity

Solution 9

(i) Computation of Net Profit Margin

Debt = (10,00,000 x 50%) = ₹ 5,00,000

Interest cost = $5,00,000 \times \frac{10}{100}$ = ₹ 50,000

Direct cost = 50,000 x 10 = ₹ 5,00,000

Sales = 5,00,000 x 150% = ₹ 7,50,000

Gross profit = 7,50,000 – 5,00,000	=	2,50,000
Less: Operating expenses	=	1,00,000
EBIT	=	1,50,000
Less: Interest	=	50,000
EBIT	=	1,00,000
Less : Tax @ 30%	=	30,000
PAT	=	70,000

Net Profit Margin = $\left(\frac{70,000}{7,50,000}\right) \times 100 = 9.33\ \%$

(ii) Net Operating Profit margin

Net operating profit margin = $\frac{EBIT}{Sales} \times 100$

$= \frac{1,50,000}{7,50,000} \times 100$

= 20 %

(iii) Return on Assets

$$\text{Return on Assets} = \frac{\text{PAT + Interest}}{\text{Total Assets}} \times 100$$

$$\text{Return on Assets} = \frac{1,20,000}{10,00,000} \times 100 = 12\%$$

OR

$$\text{Return on Assets} = \frac{\text{EBIT}}{\text{Assets}} \times 100$$

$$\text{Return on Assets} = \frac{1,50,000}{10,00,000} \times 100 = 15\%$$

OR

$$= \frac{70,000}{10,00,000} \times 100 = 7\%$$

OR

$$= \frac{1,50,000\ (1-0.3)}{10,00,000} \times 100 = 10.5\%$$

(iv) Return on Owner's Equity

$$\text{Return} = \frac{\text{PAT}}{\text{Owner's Equity}} \times 100$$

$$\text{Return on Assets} = \frac{70,000}{5,00,000} \times 100 = 14\%$$

CA Intermediate – May 2024
Financial Management

Chapter 4
Cost of Capital

Important Questions

By CA Mohnish Vora (MVSIR)

Official website for books of MVSIR– www.mvsir.in

Question 1 — **Marginal Cost of Capital**

ICAI SM, RTP May 21, MTP Oct 19

Indel Ltd. has the following capital structure, which is considered to be optimum as on 31st March, 2021:

Particulars	(Rs.)
14% Debentures	60,000
11% Preference shares	20,000
Equity Shares (10,000 shares)	3,20,000
	4,00,000

The company share has a market price of Rs. 47.20. Next year dividend per share is 50% of year 2020 EPS. The following is the uniform trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS (Rs.)	Year	EPS (Rs.)
2011	2.00	2016	3.22
2012	2.20	2017	3.54
2013	2.42	2018	3.90
2014	2.66	2019	4.29
2015	2.93	2020	4.72

The company issued new debentures carrying 16% rate of interest and the current market price of debenture is Rs. 96.

Preference shares of Rs. 18.50 (with annual dividend of Rs. 2.22 per share) were also issued.

The company is in 30% tax bracket.

A. CALCULATE after tax:
   i. Cost of new debt
   ii. Cost of new preference shares
   iii. New equity share (assuming new equity from retained earnings)

B. CALCULATE marginal cost of capital when no new shares are issued.

C. DETERMINE the amount that can be spent for capital investment before new ordinary shares must be sold, assuming that the retained earnings for next year's investment is 50 percent of earnings of 2020.

D. COMPUTE marginal cost of capital when the fund exceeds the amount calculated in (C), assuming new equity is issued at Rs. 40 per share?

Solution 1

A.

i. Cost of new debt

$$Kd = \frac{I(1-t)}{P_0} = \frac{Rs.\ 16(1-0.3)}{Rs.\ 96} = 0.11667$$

ii. Cost of new preference shares

$$Kp = \frac{Rs.\ 2.22}{Rs.\ 18.5} = 0.12$$

iii. Cost of new equity shares

$$Ke = \frac{D_1}{P_0} + g = \frac{Rs.\ 2.36}{Rs.\ 47.20} + 0.10 = 0.05 + 0.10 = 0.15$$

Calculation of g when there is a uniform trend (on the basis of EPS)

$$\frac{EPS\ (2012) - EPS\ (2011)}{EPS\ (2011)} = \frac{Rs.\ 2.20 - Rs.\ 2.00}{Rs.\ 2.00} = 0.10 \text{ or } 10\%$$

Calculation of D1

D1 = 50% of 2020 EPS = 50% of Rs. 4.72 = Rs. 2.36

B. Calculation of marginal cost of capital

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) = (4)
Debentures	0.15	0.11667	0.0175
Preference Share	0.05	0.1200	0.0060
Equity Share	0.80	0.1500	0.1200
Marginal cost of capital			0.1435

C. The company can spend the following amount without increasing marginal cost of capital and without selling the new shares:

Retained earnings = 50% of EPS of 2020 × outstanding equity shares

= 50% of Rs. 4.72 × 10,000 shares = Rs. 23,600

The ordinary equity (Retained earnings in this case) is 80% of total capital.

S So, Rs. 23,600 = 80% of Total Capital

∴ Capital investment before issuing equity shares = $\frac{Rs.\ 23,600}{0.80}$ = Rs. 29,500

D. **If the company spends in excess of Rs. 29,500, it will have to issue new equity shares at Rs. 40 per share.**

The cost of new issue of equity shares will be:

$$Ke = \frac{D_1}{P_0} + g = \frac{Rs.\ 2.36}{Rs.\ 40} + 0.10 = 0.159$$

The marginal cost of capital will be:

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) = (4)
Debentures	0.15	0.11667	0.0175
Preference Shares	0.05	0.1200	0.0060
Equity Shares (New)	0.80	0.1590	0.1272
Marginal cost of capital			0.1507

Question 2 — WACC

ICAI SM, RTP May 18, PYQ Nov 19, Jul 21

Navya Limited wishes to raise additional capital of Rs.10 lakhs for meeting its modernization plan. It has Rs. 3,00,000 in the form of retained earnings available for investments purposes.

The following are the further details

Debt/ equity mix	40%/60%
Cost of debt (before tax)	
Upto Rs. 1,80,000	10%
Beyond Rs. 1,80,000	16%
Earnings per share	Rs. 4
Dividend pay out	Rs. 2
Expected growth rate in dividend	10%
Current market price per share	Rs. 44
Tax rate	50%

i. To DETERMINE the pattern for raising the additional finance
ii. To CALCULATE the post-tax average cost of additional debt.
iii. To CALCULATE the cost of retained earnings and cost of equity, and
iv. To DETERMINE the overall weighted average cost of capital (after tax)

Solution 2

i. **Pattern of Raising Additional Finance**

Equity = 10,00,000 × 60/100 = Rs. 6,00,000

Debt = 10,00,000 × 40/100 = Rs. 4,00,000

Capital structure after Raising Additional Finance

Sources of fund	Amount (Rs.)
Shareholder's funds	
Equity capital (6,00,000 – 3,00,000)	3,00,000
Retained earnings	3,00,000
Debt at 10% p.a.	1,80,000
Debt at 16% p.a. (4,00,000 -1,80,000)	2,20,000
Total funds	10,00,000

ii. **Post-tax Average Cost of Additional Debt**

Kd = I(1 – t), where 'Kd' is cost of debt, 'I' is interest and 't' is tax rate.

On Rs. 1,80,000 = 10% (1 - 0.5) = 5% or 0.05

On Rs. 2,20,000 = 16% (1 – 0.5) = 8% or 0.08

Average Cost of Debt (Post tax) i.e.

$$Kd = \frac{(1,80,000 \times 0.05) + (2,20,000 \times 0.08)}{4,00,000} \times 100 = 6.65\%$$

iii. **Cost of Retained Earnings and Cost of Equity applying Dividend Growth Model**

$$Ke = \frac{D_1}{P_0} + g \text{ or } \frac{D_0 (1 + g)}{P_0} + g$$

$$\text{Then, } Ke = \frac{2(1.1)}{44} + 0.10 = \frac{2.2}{44} + 0.10 = 0.15 \text{ or } 15\%$$

iv. **Overall Weighted Average Cost of Capital (WACC) (After Tax)**

Particulars	Amount (Rs.)	Weights	Cost of Capital	WACC
Equity (including retained earnings)	6,00,000	0.60	15%	9.00
Debt	4,00,000	0.40	6.65%	2.66
Total	10,00,000	1.00		11.66

Question 3 **WACC**

ICAI SM, RTP May 22, PYQ Jan 21

The information relating to book value (BV) and market value (MV) weights of Ex Limited is given below:

Sources	Book Value (Rs.)	Market Value (Rs.)
Equity shares	2,40,00,000	4,00,00,000
Retained earnings	60,00,000	-
Preference shares	72,00,000	67,50,000
Debentures	18,00,000	20,80,000

Additional information:

i. Equity shares are quoted at Rs. 130 per share and a new issue priced at Rs. 125 per share will be fully subscribed; flotation costs will be Rs. 5 per share on face value.

ii. During the previous 5 years, dividends have steadily increased from Rs. 10 to Rs. 16.105 per share. Dividend at the end of the current year is expected to be Rs. 17.716 per share.

iii. 15% Preference shares with face value of Rs. 100 would realise Rs. 105 per share.

iv. . The company proposes to issue 11-year 15% debentures but the yield on debentures of similar maturity and risk class is 16%; flotation cost is 2% on face value.

v. Corporate tax rate is 30%.

You are required to DETERMINE the weighted average cost of capital of Ex Limited using both the weights.

Solution 3

i. Cost of Equity (K_e) $= \frac{D_1}{P_0 - F} + g = \frac{Rs.\ 17.716}{Rs.\ 125 - Rs.\ 5} + 0.10^*$

Ke = 0.2476

*Calculation of g :

Rs. 10 (1+g) ^{5} = Rs. 16.105

Or, $(1+g) = \frac{16.105}{10}^5 = 1.6105$

Table (FVIF) suggests that Rs. 1 compounds to Rs. 1.6105 in 5 years at the compound rate of 10 percent. Therefore, g is 10 per cent.

ii. Cost of Retained Earnings (Kr) = $\frac{D1}{P0} + g = \frac{Rs.\ 17.716}{Rs.\ 130} + 0.10 = 0.2363$

iii. Cost of Preference Shares (Kp) = $\frac{PD}{P0} = \frac{Rs.\ 15}{Rs.\ 105} = 0.1429$

iv. Cost of Debentures (Kd) = $\frac{I(1 - t) + \left[\frac{RV - NP}{n}\right]}{\frac{RV+NP}{2}}$

$= \frac{Rs.\ 15\ (1 - 0.30) + \left[\frac{Rs.\ 100 - Rs.\ 91.75}{11\ years}\right]}{\frac{Rs.\ 100 + Rs.\ 91.75}{2}} = \frac{Rs.\ 15 \times 0.70 + Rs.\ 0.75}{Rs.\ 95.875}$

$= \frac{Rs.\ 11.25}{Rs.\ 95.875} = 0.1173$

*Since yield on similar type of debentures is 16 per cent, the company would be required to offer debentures at discount.

Market price of debentures (approximation method)

= Rs. 15 ÷ 0.16 = Rs. 93.75

Sale proceeds from debentures = Rs. 93.75 – Rs. 2 (i.e., floatation cost) = Rs.91.75

Market value (P0) of debentures can also be found out using the present value method:

Total Cost of capital [BV weights and MV weights]

Source of capital	Weights		Specific cost (%)	WACC (%)	
	BV	MV		(BV × K)	(MV × K)
Equity Shares	240	320**	0.2476	59.4240	79.2320
Retained Earnings	60	80**	0.2363	14.1780	18.9040
Preference Shares	72	67.50	0.1429	10.2888	9.6458
Debentures	18	20.80	0.1173	2.1114	2.4398
Total	390	488.30		86.0022	110.2216

**Market Value of equity has been apportioned in the ratio of Book Value of equity and retained earnings i.e., 240:60 or 4:1.

Weighted Average Cost of Capital (WACC):

Using Book Value = $\frac{Rs.\ 86.0022}{Rs.\ 390} = 0.2205$ or 22.05%

Using Market Value = $\frac{Rs.\ 110.2216}{Rs.\ 488.30} = 0.2257$ or 22.57%

Question 4 — **WACC**

MTP Oct 21

The following is the capital structure of Sharda Ltd. as on 31.12.2020:

Sources	(Rs)
Equity shares: 2,00,000 shares (of Rs 100 each)	2,00,00,000
9% Preference Shares (of Rs 100 each)	60,00,000
8% Debentures	90,00,000
	3,50,00,000

The market price of the company's share is Rs 120 and it is expected that a dividend of Rs 12 per share would be declared for the year 2021. The dividend growth rate is 5% and the company is in the 30% tax bracket

i. CALCULATE the company's weighted average cost of capital.

ii. Further, in order to finance an expansion plan, the company intends to borrow a fund of Rs 2 crores bearing 12% rate of interest. In this situation, WHAT will be the company's revised weighted average cost of capital? This financing decision is expected to increase dividend from Rs 12 to Rs 14 per share. However, the market price of equity share is expected to decline from Rs 120 to Rs 115 per share.

In case of both (i) and (ii) above, use market value weight while calculating weighted average cost of capital.

Solution 4

i. Computation of the weighted average cost of capital

Source of finance (a)	Market Value of capital (Rs)	Weight (b)	After tax Cost of capital (%) (c)	WACC (%) (d) = (b) × (c)
Equity share (Working note 1) [Rs120 × 2,00,000 shares]	2,40,00,000	0.6154	15	9.231
9% Preference share	60,00,000	0.1538	9	1.3842
8% Debentures	90,00,000	0.2308	5.60	1.2925
	3,90,00,000	**1.0000**		**11.9077**

ii. Computation of Revised Weighted Average Cost of Capital

Source of finance (a)	Market Value of capital (Rs)	Weight (b)	After tax Cost of capital (%) (c)	WACC (%) (d) = (b) × (c)
Equity shares	2,30,00,000	0.3966	17.17	6.8096
(Working note 2)		0.1034	9.00	0.9306
[Rs115 × 2,00,000 shares]		0.1552	5.60	0.8691
9% Preference shares	60,00,000	0.3448	8.40	2.8963
8% Debentures	90,00,000			
12% Loan	2,00,00,000			
	5,80,00,000	**1.0000**		**11.5056**

Working Notes:

1. Cost of Equity Shares

Ke = {Dividend Per Share (D1)/Market Price Share (P0)} + Growth Rate

= 12/120 + 0.05

= 0.15 or 15%

2. Revised cost of equity shares (Ke)

Revised Ke = 14/115 + 0.05

= 0.1717 or 17.17%

Question 5

PYQ May 22, Newly added Que in ICAI SM of New Syllabus

A company issues:

- 15% convertible debentures of Rs. 100 each at par with a maturity period of 6 years. On maturity, each debenture will be converted into 2 equity shares of the company. The risk - free rate of return is 10%, market risk premium is 18% and beta of the company is 1.25. The company has paid dividend of Rs. 12.76 per share. Five year ago, it paid dividend of Rs. 10 per share. Flotation cost is 5% of issue amount.
- 5% preference shares of Rs. 100 each at premium of 10%. These shares are redeemable after 10 years at par. Flotation cost is 6% of issue amount.

Assuming corporate tax rate is 40%.

i. Calculate the cost of convertible debentures using the approximation method.

ii. Use YTM method to calculate cost of preference shares.

Year	1	2	3	4	5	6	7	8	9	10
PVIF 0.03, t	0.971	0.943	0.915	0.888	0.863	0.837	0.813	0.789	0.766	0.744
PVIF 0.05, t	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645	0.614
PVIFA 0.03, t	0.971	1.913	2.829	3.717	4.580	5.417	6.230	7.020	7.786	8.530
PVIFA 0.05, t	0.952	1.859	2.723	3.546	4.329	5.076	5.786	6.463	7.108	7.722

Interest rate	1%	2%	3%	4%	5%	6%	7%	8%	9%
FVIF i, 5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539
FVIF i, 6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677
FVIF i, 7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828

Solution 5

Calculation of Cost of Convertible Debentures:

i. Given that,

R_F = 10%, $R_m - R_f$ = 18%, B = 1.25, D_0 = 12.76, D-5 = 10, Flotation Cost = 5%

Using CAPM, $K_e = R_f + \beta (R_m - R_f)$

$= 10\% + 1.25 (18\%) = 32.50\%$

Calculation of growth rate in dividend

$12.76 = 10 (1+g)$

$1.276 = (1+g)$

(1+5%) = 1.276 ..... from FV Table, g = 5%

$$\text{Price of share after 6 years} = \frac{D_7}{K_e - g} = \frac{12.76(1.05)^7}{0.325-0.05}$$

$$P_6 = \frac{12.76 \times 1.407}{0.275} = 65.28$$

Redemption Value of Debenture (RV) = 65.28 × 2 = 130.56 (RV)

NP = 95 , n = 6

$$K_d = \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}} \times 100 \Rightarrow \frac{15(1-0.4) + \frac{(130.56-95)}{6}}{\frac{(130.56+95)}{2}} \times 100$$

$$\Rightarrow \frac{9+5.93}{112.78} \times 100 \Rightarrow K_d = 13.24\%$$

ii. Calculation of Cost of Preference Shares:

Net Proceeds = 100 (1.1) - 6% of 100 (1.1)

= 110 - 6.60 = 103.40 , Redemption Value = 100

Year	Cash Flows (Rs.)	PVF @ 3%	PV (Rs.)	PVF @ 5%	PV (Rs.)
0	103.40	1	103.40	1	103.40
1-10	-5	8.530	-42.65	7.722	-38.61
10	-100	0.744	-74.40	0.614	-61.40
			-13.65		3.39

$$\frac{5\% - 3\%}{[3.39 - (-13.65)]} \times 13.65 \Rightarrow 3\% + \frac{2\%}{17.04} \times 13.65$$

$K_p = 4.6021\%$

Question 6

PYQ Nov 22

The following is the extract of the Balance Sheet of M/s KD Ltd.:

Particulars	Amount (₹)
Ordinary shares (Face Value Rs 10/- per share)	5,00,000
Share Premium	1,00,000
Retained Profits	6,00,000
8% Preference Shares (Face Value Rs 25/- per share)	4,00,000
12% Debentures (Face value Rs 100/- each)	6,00,000

The ordinary shares are currently priced at Rs 39 ex-dividend and preference share is priced at Rs 18 cum-dividend. The debentures are selling at 120 percent ex-interest. The applicable tax rate to KD Ltd. is 30 percent. KD Ltd.'s cost of equity has been estimated at 19 percent. Calculate the WACC (weighted average cost of capital) of KD Ltd. on the basis of market value.

Solution 6

Computation of WACC on the basis of market value

W.N. 1

Cum-dividend price of Preference shares = ₹ 18

Less: Dividend (8/100) x 25 = ₹ 2

Market Price of Preference shares = ₹ 16

Kp = 2/16 = 0.125 (or) 12.5%

No. of Preference shares = 4,00,000/25 = 16,000

W.N. 2

Market price of Debentures = $\frac{120}{100} \times 100$ = ₹ 120

Kd = $\frac{12\ (1-0.3)}{120}$ = 0.07 (or) 7%

No. of Debentures = $\frac{6,00,000}{100}$ = 6,000

W.N.3

Market Price of Equity shares = ₹ 39

Ke (given) = 19% or 0.19

No. of Equity shares = $\frac{5,00,000}{10}$ = 50,000

Sources	Market Value (₹)	Nos.	Total Market value (₹)	Weight	Cost of Capital	Product
Equity Shares	36	50,000	19,50,000	0.6664	0.19	0.1266
Preference Shares	16	16,000	2,56,000	0.0875	0.125	0.0109
Debentures	120	6,000	7,20,000	0.2461	0.07	0.0172
					WACC = 0.1547	

WACC = 0.1547 or 15.47%

CA Intermediate – May 2024
Financial Management

Chapter 5
Capital Structure

Important Questions

By CA Mohnish Vora (MVSIR)

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Question 1

ICAI SM, MTP Mar 22, PYQ Jan 21

PRI Ltd. and SHA Ltd. are identical, however, their capital structure (in market-value terms) differs as follows:

Company	Debt	Equity
PRI Ltd.	60%	40%
SHA Ltd.	20%	80%

The borrowing rate for both companies is 8% in a no-tax world and capital markets are assumed to be perfect.

a.

i. If Mr. Rhi, owns 6% of the equity shares of PRI Ltd., DETERMINE his return if the Company has net operating income of Rs. 9,00,000 and the overall capitalization rate of the company (Ko) is 18%.

ii. CALCULATE the implied required rate of return on equity of PRI Ltd.

b. SHA Ltd. has the same net operating income as PRI Ltd

i. CALCULATE the implied required equity return of SHA Ltd.

ii. ANALYSE why does it differ from that of PRI Ltd

Solution 1

Value of PRI Ltd. = $\frac{\text{NOI}}{\text{Ko}} = \frac{9,00,000}{18\%}$ = Rs. 50,00,000

a.

i. Return on Shares of Mr. Rhi on PRI Ltd.

Particulars	Amount (Rs.)
Value of the company	50,00,000
Market value of debt (60% x Rs. 50,00,000)	30,00,000
Market value of shares (40% x Rs. 50,00,000)	**20,00,000**

Long term Finance Function Decisions

- **Investment decisions (I):** These relate to the **selection of assets in which funds will be invested** by a firm. Funds procured from different sources have to be invested in various

Particulars	Amount (Rs.)
Net operating income	9,00,000
Interest on debt (8% × Rs. 30,00,000)	2,40,000
Earnings available to shareholders	**6,60,000**
Return on 6% shares (6% × Rs. 6,60,000)	**39,600**

ii. Implied required rate of return on equity of PRI Ltd.

$$= \frac{\text{Rs. 6,60,000}}{\text{Rs. 20,00,000}} = 33\%$$

b.

i. Calculation of Implied rate of return of SHA Ltd

Particulars	Amount (Rs.)
Total value of company	50,00,000
Market value of debt (20% × Rs. 50,00,000)	10,00,000
Market value of equity (80% × Rs. 50,00,000)	**40,00,000**
Particulars	**Amount (Rs.)**
Net operating income	9,00,000
Interest on debt (8% × Rs. 10,00,000)	80,000
Earnings available to shareholders	**8,20,000**

Implied required rate of return on equity $= \frac{\text{Rs. 8,20,000}}{\text{Rs. 40,00,000}} = 20.5\%$

ii. Implied required rate of return on equity of SHA Ltd. is lower than that of PRI Ltd. Because SHA Ltd. uses less debt in its capital structure. As the equity capitalisation is a linear function of the debt-to-equity ratio when we use the net operating income approach, the decline in required equity return offsets exactly the disadvantage of not employing so much in the way of "cheaper" debt funds

Question 2 — **Arbitrage (Value of Levered > Value of Unlevered)**

ICAI SM, MTP Oct 21, Apr 22

Following data is available in respect of two companies having same business risk:

Capital employed = Rs. 2,00,000, EBIT = Rs. 30,000 and Ke = 12.5%

Sources	Levered Company (Rs.)	Unlevered Company (Rs.)
Debt (@10%)	1,00,000	Nil
Equity	1,00,000	2,00,000

An investor is holding 15% shares in levered company. CALCULATE the increase in annual earnings of investor if he switches his holding from Levered to Unlevered company.

Solution 2

1. Valuation of firms

Particulars	Levered Firm(Rs.)	Unlevered Firm(Rs.)
EBIT	30,000	30,000
Less: Interest on debt (10% × Rs. 1,00,000)	10,000	Nil
Earnings available to Equity shareholders	20,000	30,000
Ke	12.5%	12.5%
Value of Equity (S) (Earnings available to Equity shareholders/Ke)	1,60,000	2,40,000
Debt (D)	1,00,000	Nil
Value of Firm (V) = S + D	2,60,000	2,40,000

Value of Levered company is more than that of unlevered company. Therefore, investor will sell his shares in levered company and buy shares in unlevered company. To maintain the level of risk he will borrow proportionate amount and invest that amount also in shares of unlevered company.

2. Investment & Borrowings

Particulars	(Rs.)
Sell shares in Levered company (Rs. 1,60,000 x 15%)	24,000
Borrow money (Rs. 1,00,000 x 15%)	15,000
Buy shares in Unlevered company	39,000

3. Change in Return

Particulars	(Rs.)
Income from shares in Unlevered company (Rs. 39,000 x 12.5%)	4,875
Less: Interest on loan (Rs. 15,000 x 10%)	1,500
Net Income from unlevered firm	3,375
Less: Income from Levered firm (Rs. 24000 x 12.5%)	3,000
Incremental Income due to arbitrage	375

Question 3 — **Arbitrage (Value of Unlevered > Value of Levered)**

ICAI SM

Following data is available in respect of two companies having same business risk:

Capital employed = Rs 2,00,000, EBIT = Rs 30,000

Sources	Levered Company (Rs)	Unlevered Company (Rs)
Debt (@10%)	1,00,000	Nil
Equity	1,00,000	2,00,000
Ke	20 %	12.50 %

An investor is holding 15% shares in Unlevered company. CALCULATE the increase in annual earnings of investor if he switches his holding from Unlevered to Levered Company.

Solution 3

1. Valuation of firms

Particulars	Levered Firm (Rs)	Unlevered Firm (Rs)
EBIT	30,000	30,000
Less: interest (1,50,000 x 10%)	10,000	Nil
Earnings available to Equity Shareholder (NI)	20,000	30,000
Ke	20%	12.50%
Value of Equity (NI / Ke)	1,00,000	2,40,000
Value of Debt	1,00,000	Nil
Value of Firm	2,00,000	2,40,000

As per MM Approach (without tax), value of cos. of same risk class should have been equal. However, in above case, Value of Unlevered company is more than that of Levered company. Thus, arbitrage opportunity exists and investor will sell his shares in unlevered company and buy shares in levered company. Market value of Debt and Equity of Levered company are in the ratio of Rs 1,00,000 : Rs 1,00,000 i.e. 1:1. To maintain the level of risk he will lend proportionate amount (50%) and invest balance amount (50%) in shares of Levered company.

2. Investment & Borrowings

Sell shares in Unlevered co. (Rs 2,40,000 x 15%) → Amt available from sale	36,000
Lend money (Rs 36,000 x 50%)	18,000
Buy shares in Levered company (Rs 36,000 x 50%)	18,000
Total amount used	**36,000**

3. Change in Return

Income from shares in Levered company (18,000 x 20%)	3,600
Add: Interest on Money lent (18,000 x 10%)	1,800
Total Income after arbitrage	**5,400**
Less: Income from Unlevered firm (36,000 x 12.50%) → Before arbitrage	4,500
Incremental Income due to arbitrage	**900**

Question 4 — MM Approach

ICAI SM, RTP Nov 21, PYQ May 18

Blue Ltd., an all equity financed company is considering the repurchase of Rs. 275 lakhs equity shares and to replace it with 15% debentures of the same amount. Current market value of the company is Rs. 1,750 lakhs with its cost of capital of 20%. The company's Earnings before Interest and Taxes (EBIT) are expected to remain constant in future years. The company also has a policy of distributing its entire earnings as dividend.

Assuming the corporate tax rate as 30%, you are required to CALCULATE the impact on the following on account of the change in the capital structure as per Modigliani and Miller (MM) Approach:

i. Market value of the company
ii. Overall Cost of capital
iii. Cost of equity

Solution 4

$$\text{Market Value of Equity} = \frac{\text{Net income (NI) for equity holders}}{\text{Ke}}$$

$$\text{Rs. 1,750 lakhs} = \frac{\text{Net income (NI) for equity holders}}{0.20}$$

Net Income to equity holders/EAT = Rs. 350 lakhs

$$\text{Therefore, EBIT} = \frac{\text{EAT}}{(1-t)} = \frac{\text{Rs. 350 lakhs}}{(1-0.3)} = \text{Rs. 500 lakhs}$$

	All Equity (Rs. In lakhs)	Equity & Debt (Rs. In lakhs)
EBIT (as calculated above)	500	500
Interest on Rs. 275 lakhs @ 15%	-	41.25
EBT	500	458.75
Tax @ 30%	150	137.63
Income available to equity holders	350	321.12

i. Market value of the company

Market value of levered firm = Value of unlevered firm + Tax Advantage

= Rs.1,750 lakhs + (Rs.275 lakhs x 0.3)

= Rs.1,832.5 lakhs

ii. Overall Cost of Capital

Market Value of Equity = Market value of levered firm - Equity repurchased

= Rs. 1,832.50 lakhs – Rs. 275 lakhs = Rs. 1,557.50 lakhs

Cost of Equity (Ke) = (Net Income to equity holders / Market value of equity) x 100

= (Rs. 321.12 lakhs / Rs. 1,557.50 lakhs) x 100 = 20.62%

Cost of debt (Kd) = I (1 - t) = 15 (1 - 0.3) = 10.50%

Components	Amount (Rs. In lakhs)	Cost of Capital %	Weight	WACC (Ko) %
Equity	1,557.50	20.62	0.85	17.53
Debt	275.00	10.50	0.15	1.58
	1,832.50		1	19.11

The impact is that the Overall Cost of Capital or Ko has fallen by 0.89% (20% - 19.11%) due to the benefit of tax relief on debt interest payment.

iii. Cost of Equity

The impact is that the Overall Cost of Capital or Ko has fallen by 0.89% (20% - 19.11%) due to the benefit of tax relief on debt interest payment.

The impact is that cost of equity has risen by 0.62% (20.62% - 20%) due to the presence of financial risk i.e. introduction of debt in capital structure.

Note : Cost of Capital and Cost of equity can also be calculated with the help of following formulas, though there will be no change in the final answers.

Cost of Capital (Ko) = Keu [1 – (t x L)]

Where,

Keu = Cost of equity in an unlevered company

t = Tax rate

$$L = \frac{\text{Debt}}{\text{Debt + Equity}}$$

$$\text{So, Ko} = 0.20 \left\{1 - \left(0.3 \times \frac{\text{Rs. 275 lakhs}}{\text{Rs. 1832.5 Lakhs}}\right)\right\} = 0.191 \text{ or } 19.10\% \text{ (approx.)}$$

$$\text{Cost of Equity } (K_e) = K_{eu} + (K_{eu} - K_d) \frac{\text{Debt}(1 - t)}{\text{Equity}}$$

Where,

K_{eu} = Cost of equity in an unlevered company

K_d = Cost of debt

t = Tax rate

$$\text{So, } K_e = 0.20 + \left[(0.20 - 0.15) \times \frac{\text{Rs. 275 lakhs } (1 - 0.3)}{\text{Rs. 1832.5 Lakhs}}\right] = 0.2062 \text{ or } 20.62\%$$

Question 5 — **EBIT-EPS-MPS Analysis**

ICAI SM

The following data are presented in respect of Quality Automation Ltd.:

	Amount (Rs.)
Profit before interest and tax	52,00,000
Less: Interest on debentures @ 12%	12,00,000
Profit before tax	40,00,000
Less: Income tax @ 50%	20,00,000
Profit After tax	20,00,000
No. of equity shares (of Rs. 10 each)	8,00,000
EPS	2.5
PE Ratio	10
Market price per share	25

The company is planning to start a new project requiring a total capital outlay of Rs. 40,00,000. You are informed that a debt equity ratio (D/D+E) higher than 35%, pushes the Ke up to 12.5%, means reducing the PE ratio to 8 and rises the interest rate on additional amount borrowed to 14%. FIND OUT the probable price of share if:

i. the additional funds are raised as a loan.

ii. the amount is raised by issuing equity shares.

(Note: Retained earnings of the company is Rs. 1.2 crore)

Solution 5

In this question, EBIT after proposed extension is not given. Therefore, we can assume that existing return on capital employed will be maintained.

Working notes:

1. Return on Capital Employed = $\frac{\text{EBIT}}{\text{Capital Employed}} = \frac{52,00,000}{3,00,00,000} = 17.33\%$

Capital Employed = Debt + Equity

= Rs. 1,00,00,000 + (Rs. 80,00,000 + Rs. 1,20,00,000) = Rs. 3,00,00,000

2. Proposed EBIT = Proposed Capital Employed x Return on capital employed

= (Rs. 3,00,00,000 + Rs. 40,00,000) x 17.33% = Rs. 58,92,200

(If you take return on capital employed in full digits then accurate EBIT will be Rs. 58,93,333.)

3. Debt Equity Ratio = Debt/(Debt + Equity)

Option1: Loan option

Debt = Rs. 1,00,00,000 + Rs. 40,00,000 = Rs. 1,40,00,000

Equity = Rs. 2,00,00,000

Debt Equity ratio = 1.4crore/(1.4 crore + 2 crore) = 41.18%

Debt equity ratio has crossed the limit of 35%, hence, PE ratio in this case will be 8 times and additional borrowing will be at the rate of 14%.

Option2: Equity option

Debt = Rs. 1,00,00,000

Equity = Rs. 2,00,00,000 + Rs. 40,00,000 = Rs. 2,40,00,000

Debt Equtiy ratio = 1crore/(1 crore + 2.4 crore) = 29.41%

Debt equity ratio has not crossed the limit of 35% hence PE ratio in this case will remain at 10 times.

4. Number of equity shares to be issued in case of equity option @ Rs. 25 per share = Rs. 40,00,000 / Rs. 25 = 1,60,000

Calculation of EPS and MPS under two financial options

Particulars	Financial Options	
	Option I	Option II
	14% additional loan of 40,00,000 (Rs.)	8,00,000 equity shares @ Rs. 10 i.e 1,60,000 equity shares @ Rs. 25 (Rs.)
Profit before interest and Tax (PBIT)	58,92,200	58,92,200
Less: Interest on old debentures @ 12%	12,00,000	12,00,000
Less: Interest on additional loan (new) @ 14% on Rs. 40,00,000	5,60,000	Nil
Profit before tax	41,32,200	46,92,000
Less: Taxes @ 50%	20,66,100	23,46,100
Earnings for equity shareholders (EAT/Profit after tax)	20,66,100	23,46,100
Number of Equity Shares	8,00,000	9,60,000
Earnings per Share (EPS)	2.58	2.44
Price/ Earnings ratio	8	10
Market price per share (MPS)	20.66	24.44

Question 6 — **MM Approach**

ICAI SM, RTP May 22, PYQ Nov 18

The following data relates to two companies belonging to the same risk class

Particulars	Bee Ltd.	Cee Ltd
12% Debt	Rs. 27,00,000	-
Equity Capitalization Rate	-	18
Expected Net Operating Income	Rs. 9,00,000	Rs. 9,00,000

You are required to:

a. DETERMINE the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming no taxes as per M.M. Approach.

b. DETERMINE the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming 40% taxes as per M.M. Approach.

Solution 6

a. Assuming no tax as per MM Approach.

Calculation of Value of Firms 'Bee Ltd.' and 'Cee Ltd' according to MM Hypothesis

Market Value of 'Cee Ltd' [Unlevered(u)]

Total Value of Unlevered Firm (Vu) = [NOI/ke] = 9,00,000/0.18 = Rs. 50,00,000

Ke of Unlevered Firm (given) = 0.18

Ko of Unlevered Firm (Same as above = ke as there is no debt) = 0.18

Market Value of 'Bee Ltd' [Levered Firm (I)]

Total Value of Levered Firm (VL) = Vu + (Debt× Nil)

= Rs. 50,00,000 + (27,00,000 × nil)

= Rs. 50,00,000

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC)

Particulars	Bee Ltd.
Net Operating Income (NOI)	9,00,000
Less: Interest on Debt (I)	3,24,000
Earnings of Equity Shareholders (NI)	5,76,000
Overall Capitalization Rate (ko)	0.18

Total Value of Firm (V = NOI/ko)	50,00,000
Less: Market Value of Debt	27,00,000
Market Value of Equity (S)	23,00,000
Equity Capitalization Rate [ke = NI /S]	0.2504
Weighted Average Cost of Capital (ko)* ko = (ke×S/V) + (kd×D/V)	0.18

***Computation of WACC Bee Ltd**

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity Debt	23,00,000 27,00,000	0.46 0.54	0.2504 0.12*	0.1152 0.0648
Total	50,00,000			0.18

*Kd = 12% (since there is no tax), WACC = 18%

b. Assuming 40% taxes as per MM Approach

Calculation of Value of Firms 'Bee Ltd.' and 'Cee Ltd' according to MM Hypothesis

Market Value of 'Cee Ltd' [Unlevered(u)]

Total Value of unlevered Firm (Vu) = [NOI (1 – t)/ke] = 9,00,000 (1 – 0.40)] / 0.18

= Rs. 30,00,000

Ke of unlevered Firm (given) = 0.18

Ko of unlevered Firm (Same as above = ke as there is no debt) = 0.18

Market Value of 'Bee Ltd' [Levered Firm (I)]

Total Value of Levered Firm (VL) = Vu + (Debt× Tax)

= Rs. 30,00,000 + (27,00,000 × 0.4)

= Rs. 40,80,000

Computation of Weighted Average Cost of Capital (WACC) of 'Cee Ltd.'

= 18% (i.e. Ke = Ko)

Computation of Equity Capitalization Rate and

Weighted Average Cost of Capital (WACC) of Bee Ltd

Particulars	Bee Ltd.
Net Operating Income (NOI)	9,00,000
Less: Interest on Debt (I)	3,24,000
Earnings Before Tax (EBT)	5,76,000
Less: Tax @ 40%	2,30,400

Earnings for equity shareholders (NI)	3,45,600
Total Value of Firm (V) as calculated above	40,80,000
Less: Market Value of Debt	27,00,000
Market Value of Equity (S)	13,80,000
Equity Capitalization Rate [ke = NI/S]	0.2504
Weighted Average Cost of Capital (ko)* ko = (ke×S/V) + (kd×D/V)	13.23

***Computation of WACC Bee Ltd.**

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	13,80,000	0.338	0.2504	0.0846
Debt	27,00,000	0.662	0.072*	0.0477
Total	50,00,000			0.18

*Kd= 12% (1- 0.4) = 12% × 0.6 = 7.2%

WACC = 13.23%

Question 7 — **NI and NOI Approach**

RTP May 18

Company P and Q are identical in all respects including risk factors except for debt/equity, company P having issued 10% debentures of Rs. 18 lakhs while company Q is unlevered. Both the companies earn 20% before interest and taxes on their total assets of Rs. 30 lakhs.

Assuming a tax rate of 50% and capitalization rate of 15% from an all-equity company.

Required:

CALCULATE the value of companies' P and Q using

(i) Net Income Approach and

(ii) Net Operating Income Approach.

Solution 7

i. Valuation under Net Income Approach

Particulars	P Amount (Rs.)	Q Amount (Rs.)
Earnings before Interest & Tax (EBIT) (20% of Rs. 30,00,000)	6,00,000	6,00,000

Less: Interest (10% of Rs. 18,00,000)	1,80,000	
Earnings before Tax (EBT)	4,20,000	6,00,000
Less: Tax @ 50%	2,10,000	3,00,000
Earnings after Tax (EAT) (available to equity holders)	2,10,000	3,00,000
Value of equity (capitalized @ 15%)	14,00,000 (2,10,000 × 100/15)	20,00,000 (3,00,000 × 100/15)
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	32,00,000	20,00,000

ii. Valuation of Companies under Net Operating Income Approach

Particulars	P Amount (Rs.)	Q Amount (Rs.)
Capitalisation of earnings at 15% $\frac{\text{Rs. 6,00,000(1 – 0.5)}}{0.15}$	20,00,000	20,00,000
Less: Value of debt {18,00,000 (1 – 0.5)}	9,00,000	Nil
Value of equity	11,00,000	20,00,000
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	29,00,000	20,00,000

Question 8 **EBIT-EPS-MPS Analysis**

MTP Mar 19, PYQ Dec 21

A Company earns a profit of Rs.6,00,000 per annum after meeting its interest liability of Rs.1,20,000 on 12% debentures. The Tax rate is 50%. The number of Equity Shares of Rs.10 each are 80,000 and the retained earnings amount to Rs.18,00,000. The company proposes to take up an expansion scheme for which a sum of Rs.8,00,000 is required.

It is anticipated that after expansion, the company will be able to achieve the same return on investment as at present. The funds required for expansion can be raised either through debt at the rate of 12% or by issuing equity shares at par.

Required :

i. COMPUTE the Earnings per Share (EPS), if:

- The additional funds were raised as debt
- The additional funds were raised by issue of equity shares.

ii. ADVISE the company as to which source of finance is preferable .

Solution 8

1. Capital employed before expansion plan:

	(Rs.)
Equity shares (Rs.10 × 80,000 shares)	8,00,000
Debentures {(Rs.1,20,000/12) x 100}	10,00,000
Retained earnings	18,00,000
Total capital employed	36,00,000

2. Earnings before the payment of interest and tax (EBIT):

	(Rs.)
Profit (EBT)	6,00,000
Add: Interest	1,20,000
EBIT	7,20,000

3. Return on Capital Employed (ROCE):

$$ROCE = \frac{EBIT}{\text{Capital employed}} \times 100 = \frac{Rs.7,20,000}{Rs.36,00,000} \times 100 = 20\%$$

4. Earnings before interest and tax (EBIT) after expansion scheme:

After expansion, capital employed = Rs.36,00,000 + Rs.8,00,000 = Rs.44,00,000

Desired EBIT = 20% x Rs.44,00,000 = Rs.8,80,000

	Present situation	Expansion scheme Additional funds raised as	
		Debt	Equity
	(Rs.)	(Rs.)	(Rs.)
Earnings before Interest and Tax (EBIT)	7,20,000	8,80,000	8,80,000
Less: Interest - Old capital	1,20,000	1,20,000	1,20,000
- New capital	--	96,000 (Rs.8,00,000 x 12%)	--
Earnings before Tax (EBT)	6,00,000	6,64,000	7,60,000
Less: Tax (50% of EBT)	3,00,000	3,32,000	3,80,000

PAT	3,00,000	3,32,000	3,80,000
No. of shares outstanding	80,000	80,000	1,60,000
Earnings per Share (EPS)	3.75 (Rs.3,00,000 / 80,000)	4.15 (Rs.3,32,0008 / 0,000)	2.38 (Rs.3,80,0008 / 0,000)

Question 9 — EBIT-EPS-MPS Analysis

PYQ May 18

Sun Ltd. is considering two financing plans.

Details of which are as under:

i. Fund's requirement – Rs. 100 Lakhs

ii. Financial Plan

Plan	Equity	Debt
I	100%	
II	25%	75%

iii. Cost of debt – 12% p.a., iv. Tax Rate – 30%

iv. Equity Share Rs. 10 each, issued at a premium of Rs. 15 per share

v. Expected Earnings before Interest and Taxes (EBIT) Rs. 40 Lakhs

You are required to compute:

i. EPS in each of the plan

ii. The Financial Break Even Point

iii. Indifference point between Plan I and II

Solution 9

i. Computation of Earnings Per Share (EPS)

Plans	I (Rs.)	II (Rs.)
Earnings before interest & tax (EBIT)	40,00,000	40,00,000
Less: Interest charges (12% of Rs.75 lakh)	--	(9,00,000)
Earnings before tax (EBT)	40,00,000	31,00,000
Less: Tax @ 30%	(12,00,000)	(9,30,000)
Earnings after tax (EAT)	28,00,000	21,70,000
No. of equity shares (@ Rs.10+Rs.15)	4,00,000	1,00,000
E.P.S (Rs.)	7.00	21.70

ii. Computation of Financial Break-even Points

Plan 'I' = 0 – Under this plan there is no interest payment, hence the financial breakeven point will be zero.

Plan 'II' = Rs. 9,00,000 - Under this plan there is an interest payment of Rs.9,00,000, hence the financial break -even point will be Rs.9 lakhs

iii. Computation of Indifference Point between Plan I and Plan II:

Indifference point is a point where EBIT of Plan-I and Plan-II are equal. This can be calculated by applying the following formula:

{(EBIT –I1) (1- T)} / E1 = {(EBIT –I2) (1- T)} / E2

So

$$\frac{EBIT(1-0.3)}{4,00,000 \text{ shares}} = \frac{(EBIT - 9,00,000)(1-0.3)}{1,00,000 \text{ shares}}$$

Or, 2.8 EBIT – 25,20,000 = 0.7EBIT , Or, 2.1EBIT = 25,20,000

EBIT = 12,00,000

Question 10

PYQ Nov 22

The following are the costs and values for the firms A and B according to the traditional approach.

	Firm A	Firm B
Total value of firm, V (in ₹)	50,000	60,000
Market value of debt, D (in ₹)	0	30,000
Market value of equity, E (in ₹)	50,000	30,000
Expected net operating income (in ₹)	5,000	5,000
Cost of debt (in ₹)	0	1,800
Net Income (in ₹)	5,000	3,200
Cost of equity, Ke = NI/V	10%	10.70%

(i) Compute the Equilibrium value for Firm A and B in accordance with the M-M approach. Assume that

(a) taxes do not exist and

(b) the equilibrium value of Ke is 9.09%.

(ii) Compute Value of Equity and Cost of Equity for both the firms.

Solution 10

(i) Computation of Equilibrium value of Firms A & B under MM Approach:

As per MM approach Ko is equal to Keu

Ko = Keu (1 – t) = 9.09 (1 – 0) = 9.09

Particulars	A	B
EBIT (NOI) (₹)	5000	5000
Ko (%)	9.09	9.09
Equilibrium value (₹) (NOI/Ko) X 100	55,005.5	55,005.5
	$\frac{5,000 \times 100}{9.09}$	$\frac{5,000 \times 100}{9.09}$

(ii) Computation of value of equity and cost of equity of Firms A & B

Particulars	A	B
Equilibrium value (₹)	55,005.5	55,005.5
Less: Value of Debt	-	30,000
Value of Equity	55,005.5	25,005.5

Cost of Equity of Firm A (unlevered) = 9.09

Cost of Debt of Firm B (Kd) (levered) = (1800/30000) x 100 = 6%

Cost of Equity of Firm B (Levered) = Ko + (Ko - Kd) x (Debt / Equity)

= 9.09 + (9.09 – 6) x (30000/25005.5)

= 9.09 + 3.09 x 1.2 = 9.09 + 3.71 = 12.80% OR

CA Intermediate – May 2024
Financial Management

Chapter 6
Leverage Decisions

Important Questions

By CA Mohnish Vora (MVSIR)

Official website for books of MVSIR– www.mvsir.in

Question 1

ICAI SM, RTP May 20, MTP Nov 22, PYQ Jan 21, MTP Oct 22

The following information is related to YZ Company Ltd. for the year ended 31st March, 2020:

Particulars	
Equity share capital (of Rs. 10 each), Market Price = Rs. 20	Rs. 50 lakhs
12% Bonds of Rs. 1,000 each	Rs. 37 lakhs
Sales	Rs. 84 lakhs
Fixed cost (excluding interest)	Rs. 6.96 lakhs
Financial leverage	1.49
Profit-volume Ratio	27.55%
Income Tax Applicable	40%

You are required to CALCULATE:

i. Operating Leverage;

ii. Combined leverage; and

iii. Earnings per share.

iv. Earning Yield

Show calculations up-to two decimal points.

Solution 1

Computation of Profits after Tax (PAT)

Particulars	Amount (Rs.)
Sales	84,00,000
Contribution (Sales × P/V ratio)	23,14,200
Less: Fixed cost (excluding Interest)	(6,96,000)
EBIT (Earnings before interest and tax)	16,18,200
Less: Interest on debentures (12% x Rs.37 lakhs)	(4,44,000)
Less: Other fixed Interest (balancing figure)	(88,160)
EBT (Earnings before tax)	10,86,040*
Less: Tax @ 40%	4,34,416
PAT (Profit after tax)	6,51,624

i. Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{Rs. 23,14,200}}{\text{Rs. 16,18,200}} = 1.43$

ii. Combined Leverage = Operating Leverage × Financial Leverage = 1.43 x 1.49 = 2.13

Or,

Combined Leverage = $\frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{Contribution}}{\text{EBT}} = \frac{\text{Rs. 23,14,200}}{\text{Rs. 10,86,040}}$

= 2.13

*Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}} = \frac{\text{Rs. 16,18,200}}{\text{EBT}} = 1.49$

So, EBT = $\frac{\text{Rs. 16,18,200}}{1.49}$ = Rs.10,86,040

Accordingly, other fixed interest

= Rs. 16,18,200 - Rs. 10,86,040 - Rs. 4,44,000 = Rs. 88,160

iii. Earnings per share (EPS) = $\frac{\text{PAT}}{\text{No. of shares outstanding}} = \frac{\text{Rs. 6,51,624}}{\text{5,00,000 equity shares}}$

= Rs. 1.30

iv. Earning Yield = $\frac{\text{EPS}}{\text{Market Price}} \times 100 = \frac{\text{Rs. 1.30}}{\text{Rs. 20}} \times 100 = 6.5\%$

Question 2

ICAI SM, RTP Nov 20, MTP Nov 21, Mar 22, PYQ May 19

The capital structure of PS Ltd. for the year ended 31st March, 2020 consisted as follows:

Particulars	Amount in (Rs.)
Equity share capital (face value Rs. 100 each)	10,00,000
10% debentures (Rs. 100 each)	10,00,000

During the year 2019-20, sales decreased to 1,00,000 units as compared to 1,20,000 units in the previous year. However, the selling price stood at Rs. 12 per unit and variable cost at Rs. 8 per unit for both the years. The fixed expenses were at Rs. 2,00,000 p.a. and the income tax rate is 30%.

You are required to CALCULATE the following:

a) The degree of financial leverage at 1,20,000 units and 1,00,000 units.

b) The degree of operating leverage at 1,20,000 units and 1,00,000 units.

c) The percentage change in EPS.

d) Comment on the behaviour of operating and Financial leverages in relation to decrease in production from 1,20,000 units to 1,00,000 units.

Solution 2

Particulars	1,20,000 (Rs.)	1,00,000 (Rs.)
Sales Value	14,40,000	12,00,000
Variable Cost	(9,60,000)	(8,00,000)
Contribution	4,80,000	4,00,000
Fixed expenses	(2,00,000)	(2,00,000)
EBIT	2,80,000	2,00,000
Debenture Interest	(1,00,000)	(1,00,000)
EBT	1,80,000	1,00,000
Tax @ 30%	(54,000)	(30,000)
Profit after tax (PAT)	1,26,000	70,000

Particulars	1,20,000 (Rs.)	1,00,000 (Rs.)
i. Financial Leverage= $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{\text{Rs. 2,80,000}}{\text{Rs. 1,80,000}}$ = 1.56	$\frac{\text{Rs. 2,00,000}}{\text{Rs. 1,00,000}}$ = 2
ii. Operating leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{\text{Rs. 4,80,000}}{\text{Rs. 2,80,000}}$ = 1.71	$\frac{\text{Rs. 4,00,000}}{\text{Rs. 2,00,000}}$ = 2
iii. Earnings per share (EPS)	$\frac{\text{Rs. 1,26,000}}{\text{Rs. 10,000}}$ = 12.6	$\frac{\text{Rs. 70,000}}{\text{Rs. 10,000}}$ = Rs. 7
Decrease in EPS	= Rs. 12.6 – Rs. 7 = Rs. 5.6	
% decrease in EPS	$\frac{5.6}{12.6}$ x 100 = 44.44%	

d) When production is decreased from 1,20,000 units to 1,00,000 units both financial leverage and operating leverages increased from 1.56 to 2 and from 1.71 to 2 respectively. Increase in financial leverage and operating leverages signifies increment in business risk and financial risk.

Question 3

ICAI SM

The Sale revenue of TM excellence Ltd. @ Rs. 20 Per unit of output is Rs. 20 lakhs and Contribution is Rs. 10 lakhs. At the present level of output, the DOL of the company is 2.5. The company does not have any Preference Shares. The number of Equity Shares are 1 lakh. Applicable corporate Income Tax rate is 50% and the rate of interest on Debt Capital is 16% p.a. CALCULATE the EPS (at sales revenue of Rs. 20 lakhs) and amount of Debt Capital of the company if a 25% decline in Sales will wipe out EPS.

Solution 3

i. Calculation of Fixed Cost

$$DOL = \frac{\text{Contribution}}{\text{Contribution - Fixed Cost}} \quad \textbf{Or} \quad 2.5 = \frac{\text{Rs. 10,00,000}}{\text{EBIT}} \quad \textbf{Or} \quad EBIT = Rs.4,00,000$$

EBIT = Contribution – Fixed Cost, 4,00,000 = 10,00,000 – Fixed Cost

Fixed Cost = 10,00,000 - 4,00,000 = Rs. 6,00,000

ii. Calculation of Degree of Combined Leverage (DCL)

Question says that 25% change in sales will wipe out EPS. Here, wipe out means it will reduce EPS by 100%.

$$DCL = \frac{\text{Percentage Change in EPS}}{\text{Percentage Change in Sales}} = \frac{100\%}{25\%} = 4$$

iii. Calculation of Degree of Financial Leverage (DFL)

DCL = DOL × DFL , 4 = 2.5 × DFL , So, DFL = 1.6

Calculation of Interest and amount of Debt

$$DFL = \frac{\text{EBIT}}{\text{EBIT - Int}} \quad \text{Or, } 1.6 = \frac{\text{Rs. 4,00,000}}{\text{Rs. 4,00,000 - Int}} \quad \text{Or, Int} = \text{Rs. 1,50,000}$$

Debt × Interest rate = Amount of Interest , Debt × 16% = Rs. 1,50,000

Debt = Rs. 9,37,500

Calculation of Earnings per share (EPS)

$$EPS = \frac{(EBIT - Int)(1 - t)}{N} = \frac{(Rs.\ 4,00,000 - Rs.\ 1,50,000) \times 0.5}{1,00,000} = Rs.\ 1.25$$

Question 4

ICAI SM, RTP May 19, PYQ Nov 18, Jul 21

A Company had the following Balance Sheet as on March 31, 2019:

Equity and Liabilities	(Rs. in crore)	Assets	(Rs. in crore)
Equity Share Capital (10 crore shares of Rs. 10 each)	100	Fixed Assets (Net)	250
Reserves and Surplus	20	Current Assets	150
15% Debentures	200		
Current Liabilities	80		
	400		400

The additional information given is as under:

Fixed Costs per annum (excluding interest) Rs. 80 crores

Variable operating costs ratio 65%

Total Assets turnover ratio 2.5

Income-tax rate 40%

Required:

CALCULATE the following and comment:

i. Earnings per share Financial Leverage

ii. Operating Leverage Combined Leverage.

Solution 4

Total Assets = Rs. 400 crores

Asset Turnover Ratio = 2.5

Hence, Total Sales = 400 x 2.5 = Rs. 1,000 crores

Computation of Profits after Tax (PAT)

	(Rs. In crores)
Sales	1,000
Less: Variable operating cost (65% of Rs.1,000 crore)	(650)
Contribution	350
Less: Fixed cost (other than Interest)	(80)
EBIT	270
Less: Interest on debentures (15% x Rs.200 crore)	(30)
EBT	240
Less: Tax 40%	(96)
EAT (earnings available to equity share holders)	144

i. Earnings per share (EPS) , $EPS = \frac{\text{Rs.144 crores}}{\text{10 crore equity shares}} = \text{Rs. } 14.40$

ii. Operating Leverage

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{350}{270} = 1.296$$

It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

iii. Financial Leverage $= \frac{\text{EBIT}}{\text{EBT}} = \frac{270}{240} = 1.125$

The financial leverage is very comfortable since the debt service obligation is small vis-à-vis EBIT.

iv. Combined Leverage

$$\frac{\text{Rs.144 crores}}{\text{10 crore equity shares}} = \text{Rs. } 14.40$$

$$\text{Financial Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}}$$

Or, Operating Leverage × Financial Leverage = 1.296 x 1.125 = 1.458

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-à-vis change in sales.

Question 5

ICAI SM, RTP Nov 21, PYQ May 22

The following particulars relating to Navya Ltd. for the year ended 31st March 2021 is given:

Output	1,00,000 units at normal capacity
Selling price per unit	Rs. 40
Variable cost per unit	Rs. 20
Fixed cost	Rs. 10,00,000

The capital structure of the company as on 31st March, 2021 is as follows:

Particulars	Rs.
Equity share capital (1,00,000 shares of Rs. 10 each)	10,00,000
Reserves and surplus	5,00,000
7% debentures	10,00,000
Current liabilities	5,00,000

Navya Ltd. has decided to undertake an expansion project to use the market potential, that will involve Rs. 10 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by Rs. 5,00,000 and variable cost per unit will be decreased by 10%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion programme are planned:

i. Entirely by equity shares of Rs. 10 each at par.

ii. Rs. 5 lakh by issue of equity shares of Rs. 10 each and the balance by issue of 6% debentures of Rs. 100 each at par.

iii. Entirely by 6% debentures of Rs. 100 each at par.

FIND out which of the above-mentioned alternatives would you recommend for Navya Ltd. with reference to the risk and return involved, assuming a corporate tax of 40%.

Solution 5

Statement showing Profitability of Alternative Schemes for Financing

(Rs. in '00,000)

Particulars	Existing	Alternative Schemes		
		(i)	(ii)	(iii)
Equity Share capital (existing)	10	10	10	10
New issues	-	10	5	-
	10	**20**	**15**	**10**
7% debentures	10	10	10	10
6% debentures	-	-	5	10
	20	**30**	**30**	**30**
Debenture interest (7%)	0.7	0.7	0.7	0.7
Debenture interest (6%)	-	-	0.3	0.6
	0.7	**0.7**	**1.0**	**1.3**
Output (units in lakh)	1	1.5	1.5	1.5
Contribution per. unit Rs.(Selling price – Variable Cost)	**20**	**22**	**22**	**22**
Contribution (Rs. lakh)	**20**	**33**	**33**	**33**
Less: Fixed cost	10	15	15	15
EBIT	**10**	**18**	**18**	**18**
Less: Interest (as calculated above)	0.7	0.7	1.0	1.3
EBT	**9.3**	**17.3**	**17**	**16.7**

Less: Fixed cost	10	15	15	15
EBIT	**10**	**18**	**18**	**18**
Less: Interest (as calculated above)	0.7	0.7	1.0	1.3
EBT	**9.3**	**17.3**	**17**	**16.7**
Less: Tax (40%)	3.72	6.92	6.8	6.68
EAT	**5.58**	**10.38**	**10.20**	**10.02**
Operating Leverage (Contribution /EBIT)	**2.00**	**1.83**	**1.83**	**1.83**
Financial Leverage (EBIT/EBT)	**1.08**	**1.04**	**1.06**	**1.08**
Combined Leverage (Contribution/EBT)	**2.15**	**1.91**	**1.94**	**1.98**
EPS (EAT/No. of shares) (Rs.)	**5.58**	**5.19**	**6.80**	**10.02**
Risk	-	**Lowest**	**Lower than option (3)**	**Highest**
Return	-	**Lowest**	**Lower than option (3)**	**Highest**

From the above figures, we can see that the Operating Leverage is same in all alternatives though Financial Leverage differs. Alternative (iii) uses the maximum amount of debt and result into the highest degree of financial leverage, followed by alternative (ii).

Accordingly, risk of the company will be maximum in these options. Corresponding to this scheme, however, maximum EPS (i.e., Rs. 10.02 per share) will be also in option (iii)

So, if Navya Ltd. is ready to take a high degree of risk, then alternative (iii) is strongly recommended. In case of opting for less risk, alternative (ii) is the next best option with a reduced EPS of Rs. 6.80 per share.

In case of alternative (i), EPS is even lower than the existing option, hence not recommended

Question 6

RTP Nov 18, MTP Oct 18

A firm has sales of Rs. 75,00,000 variable cost is 56% and fixed cost is Rs. 6,00,000. It has a debt of Rs. 45,00,000 at 9% and equity of Rs. 55,00,000. You are required to INTERPRET:

i. The firm's ROI?
ii. Does it have favourable financial leverage?
iii. If the firm belongs to an industry whose capital turnover is 3, does it have a high or low capital turnover?
iv. The operating, financial and combined leverages of the firm?
v. If the sales is increased by 10% by what percentage EBIT will increase?
vi. At what level of sales the EBT of the firm will be equal to zero?
vii. If EBIT increases by 20%, by what percentage EBT will increase?

Solution 6

Income Statement

Particulars	Amount (Rs.)
Sales	75,00,000
Less: Variable cost (56% of 75,00,000)	(42,00,000)
Contribution	33,00,000
Less: Fixed costs	(6,00,000)
Earnings before interest and tax (EBIT)	27,00,000
Less: Interest on debt (@ 9% on Rs. 45 lakhs)	(4,05,000)
Earnings before tax (EBT)	22,95,000

i. $ROI = \frac{EBIT}{Capital\ Employed} \times 100 = \frac{EBIT}{Equity + Debt} \times 100$

$= \frac{27,00,000}{55,00,000 + 45,00,000} \times 100 = 27\%$

(ROI is calculated on Capital Employed)

ii. ROI = 27% and Interest on debt is 9%, hence, it has a favourable financial leverage.

iii. Capital Turnover = $\frac{Net\ Sales}{Capital}$ **Or** = $\frac{Rs.\ 75,00,000}{Rs.\ 1,00,00,000} = 0.75$

Which is very low as compared to industry average of 3

iv. Calculation of Operating, Financial and Combined leverages

a. Operating Leverage = $\frac{Contribution}{EBIT} = \frac{Rs.\ 33,00,000}{Rs.\ 27,00,000} = 1.22$ (approx)

b. Financial Leverage = $\frac{EBIT}{EBT} = \frac{Rs.\ 27,00,000}{Rs.\ 22,95,000} = 1.18$ (approx)

c. Combined Leverage = $\frac{Contribution}{EBT} = \frac{Rs.\ 33,00,000}{Rs.\ 22,95,000} = 1.44$ (approx)

Or = Operating Leverage × Financial Leverage = 1.22 × 1.18 = 1.44 (approx)

v. Operating leverage is 1.22. So if sales is increased by 10%. EBIT will be increased by 1.22 × 10 i.e. 12.20% (approx)

vi. Since the combined Leverage is 1.44, sales have to drop by 100/1.44 i.e. 69.44% to bring EBT to Zero

Accordingly, New Sales = Rs. 75,00,000 × (1-0.6944)

= Rs. 75,00,000 × 0.3056

= Rs. 22,92,000 (approx)

Hence at Rs. 22,92,000 sales level EBT of the firm will be equal to Zero

vii. Financial leverage is 1.18. So, if EBIT increases by 20% then EBT will increase by 1.18 × 20 = 23.6% (approx)

Question 7

PYQ Dec 21

Information of A Ltd. is given below:

- Earnings after tax: 5% on sales
- Income tax rate: 50%
- Degree of Operating Leverage: 4 times
- 10% Debt in capital structure: Rs 3 lakhs
- Variable costs: Rs 6 lakhs

Required:

i) From given data complete following statement:

Sales	XXXX
Less: Variable costs	Rs 6,00,000
Contribution	XXXX
Less: Fixed costs	XXXX
EBIT	XXXX
Less: Interest expenses	XXXX
EBT	XXXX
Less: Income tax	XXXX
EAT	XXXX

ii) Also calculate DFL & DCL

iii) Also calculate the percentage change in earning per share, if sales increased by 5%.

Solution 7

Earning after tax (EAT)is 5% of sales

Income tax is 50% , So, EBT is 10% of Sales

Since Interest Expenses is Rs 30,000

EBIT = 10% of Sales + Rs30,000 ..... (Equation i)

Now Degree of operating leverage = 4

So, $\frac{\text{Contribution}}{\text{EBIT}} = 4$

Or, Contribution = 4 EBIT , Or, Sales – Variable Cost = 4 EBIT

Or, Sales – Rs 6,00,000 = 4 EBIT ..... (Equation ii)

Replacing the value of EBIT of equation (i) in Equation (ii)

We get, Sales – Rs 6,00,000 = 4 (10% of Sales + Rs 30,000)

Or, Sales – Rs 6,00,000 = 40% of Sales + Rs 1,20,000

Or, 60% of Sales = Rs 7,20,000

So, Sales = $\frac{\text{Rs } 7,20,000}{60\%}$ = **Rs 12,00,000**

Contribution = Sales – Variable Cost = Rs 12,00,000 – Rs 6,00,000 =Rs 6,00,000

EBIT = $\frac{\text{Rs } 6,00,000}{4}$ = **Rs 1,50,000**

Fixed Cost = Contribution – EBIT = Rs 6,00,000 – Rs 1,50,000 = Rs 4,50,000

EBT = EBIT – Interest = Rs 1,50,000 – Rs 30,000 = **Rs 1,20,000**

EAT = 50% of Rs 1,20,000 = Rs 60,000

Income Statement

Particulars	(Rs)
Sales	**12,00,000**
Less: Variable cost	6,00,000
Contribution	6,00,000
Less: Fixed cost	4,50,000
EBIT	**1,50,000**
Less: Interest	30,000
EBT	**1,20,000**
Less: Tax (50%)	60,000
EAT	60,000

ii. **Financial Leverage**= $\frac{\text{EBIT}}{\text{EBT}} = \frac{1,50,000}{1,20,000}$ = 1.25 times

Combined Leverage = Operating Leverage × Financial Leverage

= 4x1.25 = **5 times** Or,

Combined Leverage = $\frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}}$

Combined Leverage = $\frac{\text{Contribution}}{\text{EBT}} = \frac{\text{Rs } 6,00,000}{\text{Rs } 1,20,000}$ =5 **times**

iii. Percentage Change in Earnings per share

$$\text{Combined Leverage} = \frac{\%\text{ Change in EPS}}{\%\text{ change in Sales}} = 5 = \frac{\%\text{ Change in EPS}}{5\%}$$

Therefore,% Change in EPS = **25%**

Hence, if sales increased by **5 %**, EPS will be increased by **25 %.**

Question 8

MTP Sep 23

Following are the selected financial information of A Ltd. and B Ltd. for the current Financial Year:

	A Ltd.	B Ltd.
Variable Cost Ratio	60%	50%
Interest	Rs.30,000	Rs.1,20,000
Operating Leverage	6	3
Financial Leverage	4	3
Tax Rate	30%	30%

You are required to FIND out:

I. EBIT II. Sales III. Fixed Cost

Identify the company which is better placed with reasons based on leverages.

Solution 8

Company A

$$\textbf{(i) Financial Leverage} = \frac{\text{EBIT}}{\text{EBT i.e EBIT- intrest}}$$

$$\text{So, } 4 = \frac{\text{EBIT}}{\text{EBIT- Rs. 30.000}}$$

$$\text{OR, } 4\ (\text{EBIT- } 30{,}000) = \text{EBIT}$$

$$\text{OR, } 3\ \text{EBIT} = 1{,}20{,}000$$

$$\text{OR, EBIT} = 40{,}000$$

$$\textbf{(ii) Operating Leverage} = \frac{\text{Contribution}}{\text{EBT}} \quad \text{Or,} \quad \frac{\text{Contribution}}{\text{Rs.40,000}}$$

$$\text{Or Contribution} = \text{Rs. } 2{,}40{,}000$$

$$\text{Sales} = \frac{\text{Contribution}}{\text{P/V Ratio (1 - variable cost ratio)}} = \frac{\text{Rs. } 2{,}40{,}000}{40\%}$$

$$= \text{Rs. } 6{,}00{,}000$$

(iii) Fixed Cost = Contribution – EBIT

= Rs. 2,40,000 - 40,000

Or Fixed Cost = Rs. 2,00,000

Company B

(i) Financial Leverage = $\frac{\text{EBIT}}{\text{EBT i.e EBIT- intrest}}$

So, 3 = $\frac{\text{EBIT}}{\text{EBIT- Rs. 1,20,000}}$

OR, 3 (EBIT- Rs. 1,20,000) = EBIT

OR, 3 EBIT- Rs. 1,20,000 = EBIT

OR, 2 EBIT = Rs. 3,60,000

OR, EBIT = Rs. 1,80,000

(ii) Operating Leverage = $\frac{\text{Contribution}}{\text{EBT}}$ Or, 3 $\frac{\text{Contribution}}{\text{Rs.1,80,000}}$

Or Contribution = Rs. 5,40,000

Sales = $\frac{\text{Contribution}}{\text{P/V Ratio (1 - variable cost ratio)}} = \frac{\text{Rs. 5,40,000}}{50\%}$

= Rs. 10,80,000

(iii) Fixed Cost = Contribution – EBIT

= = Rs. 5,40,000 – Rs. 1,80,000

Or Fixed Cost = Rs. 3,60,000

Income Statements of Company A and Company B

	Company A (Rs.)	Company B (Rs.)
Sales	6,00,000	10,80,000
Less: Variable cost	3,60,000	5,40,000
Contribution	2,40,000	5,40,000
Less: Fixed Cost	2,00,000	3,60,000
Earnings before interest and tax (EBIT)	40,000	1,80,000
Less: Interest	30,000	1,20,000
Earnings before tax (EBT)	10,000	60,000
Less: Tax @ 30%	3,000	18,000
Earnings after tax (EAT)	7,000	42,000

Comment based on Leverage

Company B is better than company A of the following reasons:

- Capacity of Company B to meet interest liability is better than that of companies A (from EBIT/Interest ratio)

$$A = \frac{\text{Rs. } 40,000}{\text{Rs. } 30,000} = 1.33$$

$$B = \frac{\text{Rs. } 1,80,000}{\text{Rs. } 1,20,000} = 1.50$$

Company B has the least financial risk as the total risk (business and financial) of company B is lower (combined leverage of Company A – 24 and Company B- 9)

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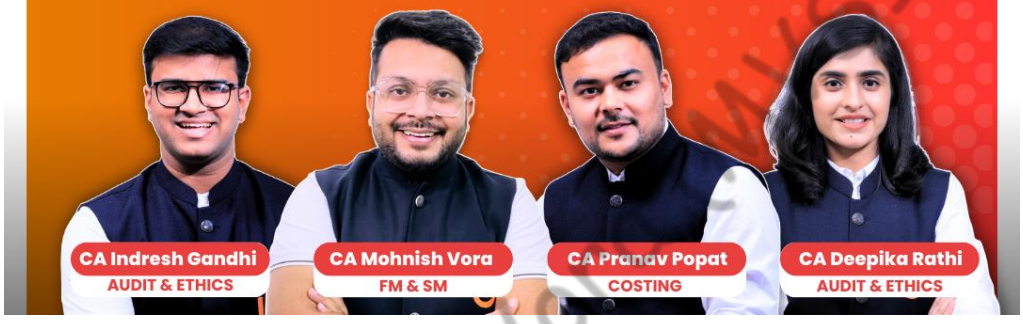

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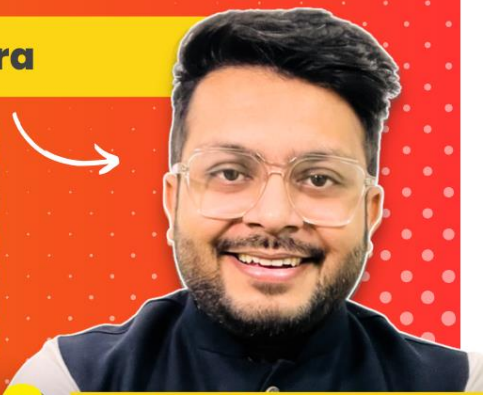

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Chapter 7
Investment Decisions

Important Questions

By CA Mohnish Vora (MVSIR)

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Question 1 — **Modified Internal Rate Of Return**

ICAI SM

An investment of Rs. 1,36,000 yields the following cash inflows (profits before depreciation but after tax). DETERMINE MIRR considering 8% as cost of capital.

Year	Cash Inflows (Rs.)
1	30,000
2	40,000
3	60,000
4	30,000
5	20,000
	1,80,000

Solution 1

Year 0 – Cash outflow = Rs. 1,36,000

The MIRR is calculated on the basis of investing the inflows at the cost of capital. The table below shows the value of the inflows, if they are immediately reinvested at 8%.

Year	Cash flow	@ 8% reinvestment rate factor	(Rs.)
1	30,000	1.3605*	40,815
2	40,000	1.2597	50,388
3	60,000	1.1664	69,984
4	30,000	1.0800	32,400
5	20,000	1.0000	20,000
			2,13,587

* Investment of Rs. 1 at the end of the year 1 is reinvested for 4 years (at the end of 5 years) shall become 1(1.08) = 1.3605. Similarly, reinvestment rate factor for remaining years shall be calculated. Please note that the investment at the end of 5th year shall be reinvested for zero year, hence, reinvestment rate factor shall be 1.

The total cash outflow in year 0 (Rs. 1,36,000) is compared with the possible inflow at year 5 and the resulting figure = 136,000/213,587 = 0.6367 is the discount factor in year 5.

By looking at the year 5 row in the present value tables, you will see that this gives a return of 9%. This means that the Rs. 2,13,587 received in year 5 is equivalent to Rs. 1,36,000 in year 0 if the discount rate is 9%. Alternatively, we can compute MIRR as follows :

Total return = 2,13,587/1,36,000 = 1.5705

MIRR = 1.5705 - 1 = 9%.

Question 2 — **Replacement Decision**

ICAI SM, RTP Nov 21, MTP Mar 23

HMR Ltd. is considering replacing a manually operated old machine with a fully automatic new machine. The old machine had been fully depreciated for tax purpose but has a book value of Rs. 2,40,000 on 31st March 2021. The machine has begun causing problems with breakdowns and it cannot fetch more than Rs. 30,000 if sold in the market at present. It will have no realizable value after 10 years. The company has been offered Rs. 1,00,000 for the old machine as a trade in on the new machine which has a price (before allowance for trade in) of Rs. 4,50,000. The expected life of new machine is 10 years with salvage value of Rs. 35,000.

Further, the company follows straight line depreciation method but for tax purpose, written down value method depreciation @ 7.5% is allowed taking that this is the only machine in the block of assets.

Given below are the expected sales and costs from both old and new machine:

	Old machine (Rs.)	New machine (Rs.)
Sales	8,10,000	8,10,000
Material cost	1,80,000	1,26,250
Labour cost	1,35,000	1,10,000
Variable overhead	56,250	47,500
Fixed overhead	90,000	97,500
Depreciation	24,000	41,500
PBT	3,24,750	3,87,250
Tax @ 30%	97,425	1,16,175
PAT	2,27,325	2,71,075

From the above information, ANALYSE whether the old machine should be replaced or not if required rate of return is 10%? Ignore capital gain tax.

PV factors @ 10%:

Year	1	2	3	4	5	6	7	8	9	10
PVF	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386

Solution 2

1. Calculation of Base for depreciation or Cost of New Machine

Particulars	(Rs.)
Purchase price of new machine	4,50,000
Less: Sale price of old machine	1,00,000
	3,50,000

2. Calculation of Profit before tax as per books

Particulars	Old machine (Rs.)	New machine (Rs.)	Difference (Rs.)
PBT as per books	3,24,750	3,87,250	62,500
Add: Depreciation as per books	24,000	41,500	17,500
Profit before tax and depreciation (PBTD)	3,48,750	4,28,750	80,000

Calculation of Incremental NPV

Year	PVF @ 10%	PBTD (Rs.)	Dep. @7.5% (Rs.)	PBT (Rs.)	Tax @30% (Rs.)	Cash Inflows (Rs.)	PV of Cash Inflows (Rs.)
	(1)	(2)	(3)	(4)	(5) = (4) x 0.30	(6) = (4) – (5) + (3)	(7) = (6) x (1)
1	0.909	80,000.00	26,250.00	53,750.00	16,125.00	63,875.00	58,062.38
2	0.826	80,000.00	24,281.25	55,718.75	16,715.63	63,284.38	52,272.89
3	0.751	80,000.00	22,460.16	57,539.84	17,261.95	62,738.05	47,116.27
4	0.683	80,000.00	20,775.64	59,224.36	17,767.31	62,232.69	42,504.93
5	0.621	80,000.00	19,217.47	60,782.53	18,234.76	61,765.24	38,356.21
6	0.564	80,000.00	17,776.16	62,223.84	18,667.15	61,332.85	34,591.73

7	0.513	80,000.00	16,442.95	63,557.05	19,067.12	60,932.88	31,258.57
8	0.467	80,000.00	15,209.73	64,790.27	19,437.08	60,562.92	28,282.88
9	0.424	80,000.00	14,069.00	65,931.00	19,779.30	60,220.70	25,533.58
10	0.386	80,000.00	13,013.82	66,986.18	20,095.85	59,904.15	23,123.00
							3,81,102.44
Add: PV of Salvage value of new machine (Rs. 35,000 x 0.386)							13,510.00
Total PV of incremental cash inflows							3,94,612.44
Less: Cost of new machine							3,50,000.00
Incremental Net Present Value							44,612.44

Question 3 — **Adjusted Present Value & Adjusted Discount Rate**

ICAI SM, PYQ May 18

XYZ Ltd. is presently all equity financed. The directors of the company have been evaluating investment in a project which will require Rs. 270 lakhs capital expenditure on new machinery. They expect the capital investment to provide annual cash flows of Rs. 42 lakhs indefinitely which is net of all tax adjustments. The discount rate which it applies to such investment decisions is 14% net.

The directors of the company believe that the current capital structure fails to take advantage of tax benefits of debt, and propose to finance the new project with undated perpetual debt secured on the company's assets. The company intends to issue sufficient debt to cover the cost of capital expenditure and the after tax cost of issue.

The current annual gross rate of interest required by the market on corporate undated debt of similar risk is 10%. The after tax costs of issue are expected to be Rs. 10 lakhs. Company's tax rate is 30%. You are required to calculate:

i. The adjusted present value of the investment,
ii. The adjusted discount rate and
iii. Explain the circumstances under which this adjusted discount rate may be used to evaluate future investments.

Solution 3

i. Calculation of Adjusted Present Value of Investment (APV)

❑ Base Case PV = PV of Annual Cash Inflow – Initial Investment

= [Rs. 42 lakhs / 0.14] (-) Rs. 270 lakhs

= (-) Rs. 270 lakhs + Rs. 300 lakhs = Rs. 30 lakhs

❑ Issue costs = Rs. 10 lakhs

Thus, the amount to be raised = Rs. 270 lakhs + Rs. 10 lakhs = Rs. 280 lakhs

❑ Annual tax relief on interest payment = Debt x Int Rate x Tax Rate

= Rs. 8.4 lakhs in perpetuity

Present value of tax relief in perpetuity = Rs. 8.4 lakhs / 0.1 = Rs. 84 lakhs

Thus, **APV** = Base case PV – Issue Costs + PV of Tax Relief on debt interest

= Rs. 30 lakhs – Rs. 10 lakhs + 84 lakhs = **Rs. 104 lakhs**

The solution given in ICAI SM & Suggested Ans is INCORRECT. The author has updated the answer here as per the concept. Follow this in exam.

ii. Calculation of Adjusted Discount Rate (ADR)

❑ Let "**a**" be the **Annual Income** at which Adjusted PV is equal to 0.

➔ **APV** = Base case PV – Issue Costs + PV of Tax Relief on debt interest

➔ 0 = [(a / 0.14) – 270 Lakhs] – 10 Lakhs + 84 lakhs ; ➔ a / 0.14 = 196 Lakhs

➔ **a = Rs 27.44 Lakhs**

❑ **ADR = Annual Income at which APV is 0 / Total Funds raised as debt**

➔ **ADR** = 27.44 Lakhs / 280 Lakhs = **9.80 %**

iii. Useable circumstances

This ADR may be used to evaluate future investments only if business risk of new venture is identical to one being evaluated here & project is to be financed by same method on same terms. The effect on company's cost of capital of introducing debt into capital structure cannot be ignored.

Question 4 **Capital Budgeting Techniques**

ICAI SM

Following data has been available for a capital project:

Annual cash inflows Rs. 1,00,000	You are required to CALCULATE
Useful life 4 years	i. Cost of project
Salvage value 0	ii. Cost of capital
Internal rate of return 12%	iii. Net present value
Profitability index 1.064	iv. Payback period

PV factors at different rates are given below:

Discount factor	12%	11%	10%	9%
1 year	0.893	0.901	0.909	0.917
2 year	0.797	0.812	0.826	0.842
3 year	0.712	0.731	0.751	0.772
4 year	0.636	0.659	0.683	0.708

Solution 4

i. **Cost of the Project**

At 12% internal rate of return (IRR), the sum of total cash inflows = cost of the project i.e initial cash outlay

Annual cash inflows = Rs. 1,00,000, Useful life = 4 years

Considering the discount factor table @ 12%, cumulative present value of cash inflows for 4 years is 3.038 (0.893 + 0.797 + 0.712 + 0.636).

Hence, Total Cash inflows for 4 years for the Project is: Rs. 1,00,000 × 3.038

= Rs. 3,03,800 , Hence, Cost of the Project = Rs. 3,03,800

ii. **Cost of Capital**

$$\text{Profitability index} = \frac{\text{Present Value of Cash inflows}}{\text{Cost of the investment}}$$

$$\Rightarrow 1.064 = \frac{\text{Present Value of Cash inflows}}{\text{Rs. 3,03,800}}$$

∴Sum of Discounted Cash inflows = Rs. 3,23,243.20

Since, Annual Cash Inflows = Rs. 1,00,000

$$\text{Hence, cumulative discount factor for 4 years} = \frac{\text{Rs. 3,23,243.20}}{\text{Rs. 1,00,000}} = 3.232$$

From the discount factor table, at discount rate of 9%, the cumulative discount factor for 4 years is 3.239 (0.917 + 0.842 + 0.772 + 0.708).

Hence, Cost of Capital = 9% (approx.)

iii. Net Present Value (NPV)

NPV = Sum of Present Values of Cash inflows – Cost of the Project

= Rs. 3,23,243.20 – Rs. 3,03,800 = Rs. 19,443.20Rs.

iv. Payback Period

$$\text{Payback period} = \frac{\text{Cost of the Project}}{\text{Annual Cash Inflows}} = \frac{\text{Rs. 3,03,800}}{\text{Rs. 1,00,000}} = 3.038 \text{ years}$$

Question 5 — **Capital Budgeting Techniques**

ICAI SM

Lockwood Limited wants to replace its old machine with a new automatic machine. Two models A and B are available at the same cost of Rs. 5 lakhs each. Salvage value of the old machine is Rs. 1 lakh. The utilities of the existing machine can be used if the company purchases model A. Additional cost of utilities to be purchased in this case will be Rs. 1 lakh. If the company purchases B, then all the existing utilities will have to be replaced with new utilities costing Rs. 2 lakhs. The salvage value of the old utilities will be Rs. 0.20 lakhs. The earnings after taxation are expected to be:

Year	Cash inflows of A (Rs.)	Cash inflows of B (Rs.)	P.V. Factor @ 15%
1	1,00,000	2,00,000	0.870
2	1,50,000	2,10,000	0.756
3	1,80,000	1,80,000	0.658
4	2,00,000	1,70,000	0.572
5	1,70,000	40,000	0.497
Salvage Value at the end of Year 5	50,000	60,000	

The targeted return on capital is 15%. You are required to

i. COMPUTE, for the two machines separately, net present value, discounted payback period and desirability factor and

ii. STATE which of the machines is to be selected?

Solution 5

Working: Calculation of Cash -outflow at year zero

Particulars	A (Rs.)	B (Rs.)
Cost of Machine	5,00,000	5,00,000
Cost of Utilities	1,00,000	2,00,000
Salvage value of Old Machine	(1,00,000)	(1,00,000)
Salvage of value Old Utilities	-	(20,000)
Total Expenditure (Net)	5,00,000	5,80,000

d) Calculation of NPV

Year	PV Factor @ 15%	Machine A		Machine B	
		Cash Inflows (Rs.)	Discounted value of inflows (Rs.)	Cash Inflows (Rs.)	Discounted value of inflows (Rs.)
0	1.000	(5,00,000)	(5,00,000)	(5,80,000)	(5,80,000)
1	0.870	1,00,000	87,000	2,00,000	1,74,000
2	0.756	1,50,000	1,13,400	2,10,000	1,58,760
3	0.658	1,80,000	1,18,440	1,80,000	1,18,440
4	0.572	2,00,000	1,14,400	1,70,000	97,240
5	0.497	1,70,000	84,490	40,000	19,880
Salvage	0.497	50,000	24,850	60,000	29,820
Net Present Value			42,580		18,140

Since the Net present Value of both the machines is positive both are acceptable.

b) Discounted Pay-back Period (Amount in Rs.)

Year	Machine A		Machine B	
	Discounted cash inflows	Cumulative Discounted cash inflows	Discounted cash inflows	Cumulative Discounted cash inflows
1	87,000	87,000	1,74,000	1,74,000
2	1,13,400	2,00,400	1,58,760	3,32,760
3	1,18,440	3,18,840	1,18,440	4,51,200
4	1,14,400	4,33,240	97,240	5,48,440
5	1,09,340*	5,42,580	49,700*	5,98,140

* Includes salvage value.

Discounted Payback Period (For A and B):

Machine A = 4 years + $\frac{5,00,000 - 4,33,240}{1,09,340}$ = 4.61 years

Machine B = 4 years + $\frac{5,80,000 - 5,48,440}{49,700}$ = 4.63 years

c) Desirability Factor or Profitability Index

$$\frac{\text{Sum of Present Value of Cash inflows}}{\text{Initial Cash outflow}}$$

➡ Machine A = $\frac{\text{Rs. } 5,42,580}{\text{Rs. } 5,00,000}$ = 1.08

➡ Machine B = $\frac{\text{Rs. } 5,98,140}{\text{Rs. } 5,80,000}$ = 1.03

ii. Since the absolute surplus in the case of A is more than B and also the desirability factor, it is better to choose A.

The discounted payback period in both the cases is almost same, also the net present value is positive in both the cases, but the desirability factor (profitability index) is higher in the case of Machine A, it is therefore better to choose Machine A

Question 6 **NPV & Project Evaluation**

ICAI SM

Elite Cooker Company is evaluating three investment situations:

(1) Produce a new line of aluminium skillets,

(2) Expand its existing cooker line to include several new sizes, and

(3) Develop a new, higher-quality line of cookers.

If only the project in question is undertaken, the expected present values and the amounts of investment required are:

Project	Investment required Rs.	Present value of Future Cash Flows Rs.
1	2,00,000	2,90,000
2	1,15,000	1,85,000
3	2,70,000	4,00,000

- If projects 1 and 2 are jointly undertaken, there will be no economies; the investments required and present values will simply be the sum of the parts.
- With projects 1 and 3, economies are possible in investment because one of the machines acquired can be used in both production processes. The total investment required for projects 1 and 3 combined is Rs. 4,40,000.
- If projects 2 and 3 are undertaken, there are economies to be achieved in marketing and producing the products but not in investment. The expected present value of future cash flows for projects 2 and 3 is Rs. 6,20,000.
- If all three projects are undertaken simultaneously, the economies noted will still hold. However, a Rs. 1,25,000 extension on the plant will be necessary, as space is not available for all three projects.

CALCULATE NPV of the projects and STATE which project or projects should be chosen?

Solution 6

Calculation of NPV

Project	Investment Required	Present value of Future Cash Flows	Net Present value
	Rs.	Rs.	Rs.
1	2,00,000	2,90,000	90,000
2	1,15,000	1,85,000	70,000
3	2,70,000	4,00,000	1,30,000
1 and 2	3,15,000	4,75,000	1,60,000
1 and 3	4,40,000	6,90,000	2,50,000
2 and 3	3,85,000	6,20,000	2,35,000
1, 2 and 3 (Refer Working note)	6,80,000*	9,10,000	2,30,000

Working Note:

(i) Total Investment required if all the three projects are undertaken simultaneously:

	Rs.
Project 1 & 3	4,40,000
Project 2	1,15,000
Plant extension cost	1,25,000
Total	6,80,000

(ii) Total of Present value of Cash flows if all the three projects are undertaken simultaneously:

	Rs.
Project 2 & 3	6,20,000
Project 1	2,90,000
Total	9,10,000

Projects 1 and 3 should be chosen, as they provide the highest net present value.

Question 7 — **Project Evaluation Under NPV & PI Methods**

RTP Nov 22, ICAI SM, PYQ Nov 22

NavJeevani hospital is considering to purchase a machine for medical projectional radiography which is priced at Rs. 2,00,000. The projected life of the machine is 8 years and has an expected salvage value of Rs. 18,000 at the end of 8th year. The annual operating cost of the machine is Rs. 22,500. It is expected to generate revenues of Rs. 1,20,000 per year for eight years. Presently, the hospital is outsourcing the radiography work to its neighbour Test Center and is earning commission income of Rs. 36,000 per annum, net of taxes.

Required:

ANALYSE whether it would be profitable for the hospital to purchase the machine. Give your recommendation under

(i) Net Present Value method

(ii) Profitability Index method

Consider tax @30%. PV factors at 10% are given below:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467

Solution 7

Determination of Cash inflows

Particulars	(Rs.)
Sales Revenue	1,20,000
Less: Operating Cost	22,500
	97,500
Less: Depreciation (Rs. 2,00,000 – Rs. 18,000)/8	22,750
Net Income	74,750
Less: Tax @ 30%	22,425
Earnings after Tax (EAT)	52,325
Add: Depreciation	22,750
Cash inflow after tax per annum	75,075
Less: Loss of Commission Income	36,000
Net Cash inflow after tax per annum	39,075
In 8th Year :	
New Cash inflow after tax	39,075
Add: Salvage Value of Machine	18,000
Net Cash inflow in year 8	57,075

i. **Calculation of Net Present Value (NPV)**

Year	CFAT (Rs.)	PV Factor @10%	Present Value of Cash inflows (Rs.)
1 to 7	39,075	4.867	1,90,178.03
8	57,075	0.467	26,654.03
			2,16,832.06
		Less: Cash Outflows	2,00,000.00
		NPV	16,832.06

ii. **Calculation of Profitability Index**

$$\text{Profitability Index} = \frac{\text{Sum of discounted cash in flows}}{\text{Present value of cash out flows}} \Rightarrow \frac{2,16,832.06}{2,00,000} = 1.084$$

Advise: Since the net present value (NPV) is positive and profitability index is also greater than 1, the hospital may purchase the machine

Question 8 — **Replacement Decision**

ICAI SM, PYQ Jul 21

An existing company has a machine which has been in operation for two years, its estimated remaining useful life is 4 years with no residual value in the end. Its current market value is Rs 3 lakhs. The management is considering a proposal to purchase an improved model of a machine gives increase output. The details are as under:

Particulars	Existing Machine	New Machine
Purchase Price	Rs 6,00,000	Rs 10,00,000
Estimated Life	6 years	4 years
Residual Value	0	0
Annual Operating days	300	300
Operating hours per day	6	6
Selling price per unit	Rs 10	Rs 10
Material cost per unit	Rs 2	Rs 2
Output per hour in units	20	40
Labour cost per hour	Rs 20	Rs 30
Fixed overhead per annum excluding depreciation	Rs 1,00,000	Rs 60,000
Working Capital	Rs 1,00,000	Rs 2,00,000
Income-tax rate	30%	30%

Assuming that - cost of capital is 10% and the company uses written down value of depreciation @ 20% and it has several machines in 20% block. Advice the management on the Replacement of Machine as per the NPV method.

Discounting Factors	Year 1	Year 2	Year 3	Year 4
10%	0.909	0.826	0.751	0.683

Solution 8

i. Calculation of Net Initial Cash Outflows:

Particulars	Rs
Purchase Price of new machine	10,00,000
Add: Net Working Capital	1,00,000
Less: Sale proceeds of existing machine	3,00,000
Net initial cash outflows	8,00,000

ii. Calculation of annual Profit Before Tax and depreciation

Particulars	Existing machine	New Machine	Differential
(1)	(2)	(3)	(4) = (3) – (2)
Annual output	36,000 units	72,000 units	36,000 units
	Rs	Rs	Rs
(A) Sales revenue @ Rs 10 per unit	3,60,000	7,20,000	3,60,000
(B) Cost of Operation			
Material @ Rs 2 per unit	72,000	1,44,000	72,000
Labour			
Old= 1,800 x Rs 20	36,000		
New= 1,800 x Rs 30		54,000	18,000
Fixed overhead excluding depreciation	1,00,000	60,000	(40,000)
Total Cost (B)	2,08,000	2,58,000	50,000
Profit Before Tax and depreciation (PBTD) (A – B)	**1,52,000**	**4,62,000**	**3,10,000**

iii. Calculation of Net Present value on replacement of machine

Year	PBTD	Depreciation @ 20% WDV	PBT	Tax @ 30%	PAT	Net cash flow	PVF @ 10%	PV
(1)	(2)	(3)	(4 = 2-3)	(5)	(6 = 4-5)	(7 = 6 + 3)	(8)	(9 = 7 x 8)
1	3,10,000	1,40,000	1,70,000	51,000	1,19,000	2,59,000	0.909	2,35,431.000
2	3,10,000	1,12,000	1,98,000	59,400	1,38,600	2,50,600	0.826	2,06,995.600
3	3,10,000	89,600	2,20,400	66,120	1,54,280	2,43,880	0.751	1,83,153.880
4	3,10,000	71,680	2,38,320	71,496	1,66,824	2,38,504	0.683	1,62,898.232
								7,88,478.712
Add: Release of net working capital at year end 4 (1,00,000 x 0.683)								68,300.000
Less: Initial Cash Outflow								8,00,000.000
NPV								**56,778.712**

Advice: Since the incremental NPV is positive, existing machine should be replaced.

i. Calculation of Annual Output

Annual output = (Annual operating days x Operating hours per day) x output per hour

Existing machine = (300 x 6) x 20 = 1,800 x 20 = 36,000 units

New machine = (300 x 6) x 40 = 1,800 x 40 = 72,000 units

Base for incremental depreciation

Particulars		(Rs)
WDV of Existing Machine		
Purchase price of existing machine		6,00,000
Less: Depreciation for year 1	1,20,000	
Depreciation for Year 2	96,000	2,16,000
WDV of Existing Machine (i)		**3,84,000**
Depreciation base of New Machine		
Purchase price of new machine		10,00,000
Add: WDV of existing machine		3,84,000
Less: Sales value of existing machine		3,00,000
Depreciation base of New Machine (ii)		**10,84,000**
Base for incremental depreciation [(ii) – (i)]		**7,00,000**

(Note: The above solution have been done based on incremental approach)

Question 9 — Replacement Decision

ICAI SM, RTP May 22

ABC & Co. is considering whether to replace an existing machine or to spend money on revamping it. ABC & Co. currently pays no taxes. The replacement machine costs Rs. 18,00,000 now and requires maintenance of Rs. 2,00,000 at the end of every year for eight years. At the end of eight years, it would have a salvage value of Rs. 4,00,000 and would be sold. The existing machine requires increasing amounts of maintenance each year and its salvage value fall each year as follows:

Year	Maintenance (Rs.)	Salvage (Rs.)
Present	0	8,00,000
1	2,00,000	5,00,000
2	4,00,000	3,00,000
3	6,00,000	2,00,000
4	8,00,000	0

The opportunity cost of capital for ABC & Co. is 15%.

REQUIRED:

When should the company replace the machine?

The following present value table below is given for you:

Year	1	2	3	4	5	6	7	8
Present value of Rs. 1 at 15% Discount rate	0.8696	0.7561	0.6575	0.5718	0.4972	0.4323	0.3759	0.3269

Solution 9

Statement of Operating Profit from processing of waste

	Particulars	(Rs.)
i	Cost of new machine now Add: PV of annual repairs @ Rs. 2,00,000 per annum for 8 years (Rs. 2,00,000 x 4.4873)	18,00,000 8,97,460
		26,97,460
	Less: PV of salvage value at the end of 8 years (Rs. 4,00,000 x 0.3269)	1,30,760
		25,66,700
	Equivalent annual cost (EAC) (Rs. 25,66,700/4.4873)	5,71,992

PV of cost of replacing the old machine in each of 4 years with new machine

Scenario	Year	Cash Flow	PV @ 15%	PV
		Rs.		Rs.
Replace Immediately	0 0	(5,71,992) 8,00,000	1.00 1.00	(5,71,992) 8,00,000
				2,28,008
Replace in one year	1 1 1	(5,71,992) (2,00,000) 5,00,000	0.8696 0.8696 0.8696	(4,97,404) (1,73,920) 4,34,800
				(2,36,524)
Replace in two years	1 2 2 2	(2,00,000) (5,71,992) (4,00,000) 3,00,000	0.8696 0.7561 0.7561 0.7561	(1,73,920) (4,32,483) (3,02,440) 2,26,830
				(6,82,013)
Replace in three years	1 2 3 3 3	(2,00,000) (4,00,000) (5,71,992) (6,00,000) 2,00,000	0.8696 0.7561 0.6575 0.6575 0.6575	(1,73,920) (3,02,440) (3,76,085) (3,94,500) 1,31,500
				(11,15,445)
Replace in four years	1 2 3 4 4	(2,00,000) (4,00,000) (6,00,000) (5,71,992) (8,00,000)	0.8696 0.7561 0.6575 0.5718 0.5718	(1,73,920) (3,02,440) (3,94,500) (3,27,065) (4,57,440)
				(16,55,365)

Advice: The company should replace the old machine immediately because the PV of cost of replacing the old machine with new machine is least

Question 10 — Capital Budgeting Techniques

RTP May 18, MTP Aug 18

A company has to make a choice between two projects namely A and B.

The initial capital outlay of two Projects are Rs. 1,35,000 and Rs. 2,40,000 respectively for A and B.

There will be no scrap value at the end of the life of both the projects.

The opportunity Cost of Capital of the company is 16%. The annual incomes are as under:

Year	Project A (Rs.)	Project B (Rs.)	Discounting factor @ 16%
1	--	60,000	0.862
2	30,000	84,000	0.743
3	1,32,000	96,000	0.641
4	84,000	1,02,000	0.552
5	84,000	90,000	0.476

Required:

i. CALCULATE for each project:

ii. Discounted payback period

iii. Profitability index

iv. Net present value

DECIDE which of these projects should be accepted?

Solution 10

1. Computation of Net Present Values of Projects

Year	Cash flows		Disct. factor @ 16 %	Discounted Cash flow	
	Project A Rs.	Project B Rs.		Project A Rs.	Project B Rs.
	(1)	*(2)*	*(3)*	*(3) × (1)*	*(3) × (2)*
0	(1,35,000)	(2,40,000)	1.000	(1,35,000)	(2,40,000)
1	--	60,000	0.862	--	51,720
2	30,000	84,000	0.743	22,290	62,412
3	1,32,000	96,000	0.641	84,612	61,536
4	84,000	1,02,000	0.552	46,368	56,304
5	84,000	90,000	0.476	39,984	42,840
Net present value				58,254	34,812

2. Computation of Cumulative Present Values of Projects Cash inflows

Year	Cash flows		Discounted Cash flow	
	PV of cash inflows (Rs.)	Cumulative PV (Rs.)	PV of cash inflows (Rs.)	Cumulative PV (Rs.)
1	--	--	51,720	51,720
2	22,290	22,290	62,412	1,14,132
3	84,612	1,06,902	61,536	1,75,668
4	46,368	1,53,270	56,304	2,31,972
5	39,984	1,93,254	42,840	2,74,812

Discounted payback period: (Refer to Working note 2)

Cost of Project A = Rs. 1,35,000

Cost of Project B = Rs. 2,40,000

Cumulative PV of cash inflows of Project A after 4 years = Rs. 1,53,270

Cumulative PV of cash inflows of Project B after 5 years = Rs. 2,74,812

A comparison of projects cost with their cumulative PV clearly shows that the project A's cost will be recovered in less than 4 years and that of project B in less than 5 years. The exact duration of discounted payback period can be computed as follows:

	Project A	Project B
Excess PV of cash inflows over the project cost (Rs.)	18,270 (Rs. 1,53,270 – Rs. 1,35,000)	34,812 (Rs. 2,74,812 – Rs. 2,40,000)
Computation of period required to recover excess amount of cumulative PV over project cost (Refer to Working note 2	0.39 year (Rs. 18,270 ÷ Rs. 46,368)	0.81 years (Rs. 34,812 ÷ Rs. 42,840)
Discounted payback period	3.61 year (4 - 0.39) years	4.19 years (5 - 0.81) years

ii. Profitability Index(PI) : $\frac{\text{Sum of discounted cash inflows}}{\text{Initian cash outlay}}$ = 1.49

Profitability Index (for Project A) = $\frac{\text{Rs. 1,93,254}}{\text{Rs. 1,35,000}}$ = 1.43

Profitability Index (for Project B) = $\frac{\text{Rs. 2,74,812}}{\text{Rs. 2,40,000}}$ = 1.15

iii. Net present value(NPV) (for Project A) = Rs. 58,254

Net present value(NPV) (for Project B) = Rs. 34,812

(Refer to Working note 1)

Conclusion : As the NPV, PI of Project A is higher and Discounted Pay back is lower, therefore Project a should be accepted

Question 11 **(Project Feasibility)**

MTP April 22, Newly added Que in ICAI SM of New Syllabus

Manoranjan Ltd is a News broadcasting channel having its broadcasting Centre in Mumbai. There are total 200 employees in the organisation including top management. As a part of employee benefit expenses, the company serves tea or coffee to its employees, which is outsourced from a third -party. The company offers tea or coffee three times a day to each of its employees. 120 employees prefer tea all three times, 40 employees prefer coffee all three times and remaining prefer tea only once in a day. The third-party charges Rs. 10 for each cup of tea and Rs. 15 for each cup of coffee. The company works for 200 days in a year.

Looking at the substantial amount of expenditure on tea and coffee, the finance department has proposed to the management an installation of a master tea and coffee vending machine which will cost Rs. 10,00,000 with a useful life of five years. Upon purchasing the machine, the company will have to enter into an annual maintenance contract with the vendor, which will require a payment of Rs. 75,000 every year. The machine would require electricity consumption of 500 units p.m. and current incremental cost of electricity for the company is Rs. 12 per unit. Apart from these running costs, the company will have to incur the following consumables expenditure also:

1. Packets of Coffee beans at a cost of Rs. 90 per packet.
2. Packet of tea powder at a cost of Rs. 70 per packet.
3. Sugar at a cost of Rs. 50 per Kg.
4. Milk at a cost of Rs. 50 per litre.
5. Paper cup at a cost of 20 paise per cup.

Each packet of coffee beans would produce 200 cups of coffee and same goes for tea powder packet. Each cup of tea or coffee would consist of 10g of sugar on an average and 100 ml of milk.

The company anticipate that due to ready availability of tea and coffee through vending machines its employees would end up consuming more tea and coffee.

It estimates that the consumption will increase by on an average 20% for all class of employees

Also, the paper cups consumption will be 10% more than the actual cups served due to leakages in them.

The company is in the 25% tax bracket and has a current cost of capital at 12% per annum.

Straight line method of depreciation is allowed for the purpose of taxation.

You as a financial consultant is required to ADVISE on the feasibility of acquiring the vending machine.

PV factors @ 12%:

Year	1	2	3	4	5
PVF	0.8929	0.7972	0.7118	0.6355	0.5674

Solution 11

Particulars	Workings	Amount (Rs.)
Savings in existing Tea & Coffee charges	(120 × 10 ×3) + (40 ×15 × 3) + (40 ×10 × 1) x 200 days	11,60,000
AMC of machine		(75,000)
Electricity charges	500 ×12 ×12	(72,000)
Coffee Bean	(W.N.) 144 × 90	(12,960)
Tea Powder	(W.N.) 480 × 70	(33,600)
Sugar	(W.N.) 1248 × 50	(62,400)
Milk	(W.N.) 12480 × 50	(6,24,000)
Paper Cup	(W.N.) 1,37,280 × 0.2	(27,456)
Depreciation	10,00,000/5	(2,00,000)
Profit before Tax		**52,584**
(-) Tax @ 25%		(13,146)
Profit after Tax		**39,438**
Depreciation		2,00,000
CFAT		**2,39,438**

Year	Particulars	CF	PVF @ 12%	PV
0	Cost of machine	(10,00,00)	1	(10,00,000)
1-5	CFAT	2,39,438	3.6048	8,63,126
Net Present Value				(1,36,874)

Since NPV of the machine is negative, it should not be purchased.

Working Note: Computation of Qty of consumable

No. of Tea Cups = [(120 × 3 × 200 days) + (40 × 1 × 200 days) × 1.2 = 96,000

No. of Coffee cups = 40 × 3 × 200 days × 1.2 = 28,800

No. of coffee beans packet = $\frac{28,800}{200}$ = 144

No. of Tea Powder Packets = $\frac{96,000}{200}$ = 480

Qty of Sugar = $\frac{(96,000 + 28,800) \times 10\ g}{1,000\ g}$ = 1248 kgs

Qty of Milk = $\frac{(96,000 + 28,800) \times 100\ ml}{1,000\ ml}$ = 12,480 litres

No. of paper cups = (96,000 + 28,800) × 1.1 = 1,37,280

Question 12 — **Annualized Equivalent Approach**

PYQ Jul 21

Stand Ltd. is contemplating replacement of one of its machines which has become outdated and inefficient. Its financial manager has prepared a report outlining two possible replacement machines. The details of each machine are as follows:

	Machine 1	Machine 2
Initial investment	Rs 12,00,000	Rs 16,00,000
Estimated useful life	3 years	5 years
Residual Value	Rs 1,20,000	Rs 1,00,000
Contribution per annum	Rs 11,60,000	Rs 12,00,000
Fixed maintenance costs per annum	Rs 40,000	Rs 80,000
Other fixed operating costs per annum	Rs 7,20,000	Rs 6,10,000

The maintenance costs are payable annually in advance. All other cash flows apart from the initial investment assumed to occur at the end of each year. Depreciation has been calculated by straight line method and has been included in other fixed operating costs. The expected cost of capital for this project is assumed as 12% p.a.

Required:

Which machine is more beneficial, using Annualized Equivalent Approach? Ignore tax.

Year	1	2	3	4	5	6
$PVIF_{0.12,t}$	0.893	0.893	0.712	0.636	0.567	0.507
$PVIFA_{0.12,t}$	0.893	1.690	1.690	3.038	3.605	4.112

Solution 12

Calculation of Net Cash flows

Machine 1

Other fixed operating costs (excluding depreciation) = 7,20,000-[(12,00,000-1,20,000)/3]

= Rs 3,60,000

Year	Initial Investment (Rs)	Contribution (Rs)	Fixed Maintenance costs (Rs)	Other fixed operating costs (excluding depreciation) (Rs)	Residual Value (Rs)	Net cash flow (Rs)
0	(12,00,000)		(40,000)			(12,40,000)
1		11,60,000	(40,000)	(3,60,000)		7,60,000
2		11,60,000	(40,000)	(3,60,000)		7,60,000
3		11,60,000		(3,60,000)	1,20,000	9,20,000

Year	Initial Investment (Rs)	Contribution (Rs)	Fixed maintenance costs (Rs)	Other fixed operating costs (excluding depreciation) (Rs)	Residual Value (Rs)	Net cash flow (Rs)
0	(16,00,000)		(80,000)			(16,80,000)
1		12,00,000	(80,000)	(3,10,000)		8,10,000
2		12,00,000	(80,000)	(3,10,000)		8,10,000
3		12,00,000	(80,000)	(3,10,000)		8,10,000
4		12,00,000	(80,000)	(3,10,000)		8,10,000
5		12,00,000		(3,10,000)	1,00,000	9,90,000

Calculation of Net Present Value

Year		Machine 1		Machine 2	
	12% discount factor	Net cash flow (Rs)	Present value (Rs)	Net cash flow (Rs)	Present value (Rs)
0	1.000	(12,40,000)	(12,40,000)	(16,80,000)	(16,80,000)
1	0.893	7,60,000	6,78,680	8,10,000	7,23,330
2	0.797	7,60,000	6,05,720	8,10,000	6,45,570
3	0.712	9,20,000	6,55,040	8,10,000	5,76,720
4	0.636			8,10,000	5,15,160
5	0.567			9,90,000	5,61,330
NPV @ 12%			**6,99,440**		**13,42,110**
PVAF @ 12%			2.402		3.605
Equivalent Annualized Criterion			**2,91,190.674**		**3,72,291.262**

Recommendation: Machine 2 is more beneficial using Equivalent Annualized Criterion.

Question 13 (Project Evaluation)

MTP Oct 21

Sadbhavna Limited is a manufacturer of computers. It wants to introduce artificial intelligence while making computers. It estimates that the annual savings from the artificial intelligence (AI) include a reduction of five employees with annual salaries of Rs 3,00,000 each,

Rs 3,00,000 from reduction in production delays caused by inventory problem, reduction in lost sales Rs 2,50,000 and Rs 2,00,000 from billing issues.

The purchase price of the system for installation of artificial intelligence is Rs 20,00,000 with installation cost of Rs 1,00,000. The life of the system is 5 years and it will be depreciated on a straight -line basis.

The salvage value is zero which will be its market value after the end of its life of five years.

However, the operation of the new system for AI requires two computer specialists with annual salaries of Rs 5,00,000 per person.

Also, the estimated maintenance and operating expenses of 1,50,000 is required.

The company's tax rate is 30% and its required rate of return is 12%.

From the above information:

i. CALCULATE the initial cash outflow and annual operating cash flow over its life of 5 years.

ii. Further, EVALUATE the project by using Payback Period, Net Present Value and Profitability Index.

iii. You are also REQUIRED to obtain the cash flows and NPV on the assumption that book salvage value for depreciation purposes is Rs 2,00,000 even though the machine is having no real worth in terms of its resale value. Also, the book salvage value of Rs 2,00,000 is allowed for tax purposes.

Also COMMENT on the acceptability of the project in (ii) and (iii) above.

Solution 13

i. **Project's Initial Cash Outlay**

Cost	20,00,000
Installation Expenses	1,00,000
Total Cash Outflow	21,00,000
Depreciation per year = 21,00,000/5 =	4,20,000

Project's Operating Cash Flows over its 5-year life

Savings (A)

Reduction in salaries (Rs 3,00,000 x 5)	15,00,000
Reduction in production delays	3,00,000
Reduction in lost sales	2,50,000
Gains due to timely billing	2,00,000
	22,50,000

Costs (B)

Depreciation	4,20,000
Additional Specialist Cost (Rs 5,00,000 x 2)	10,00,000
Maintenance Cost	1,50,000
	15,70,000
Increase in Profit before tax **(A-B)**	6,80,000
Less: Tax @ 30%	2,04,000
Profit after tax	**4,76,000**

Cash Inflows = Profit after tax + Depreciation

= 4,76,000 + 4,20,000 = 8,96,000

Year	Cash Inflows	PVAF (12%,5y)	Total PV
1-5	8,96,000	3.605	32,30,080
Less: Total Initial Cash Outflow			**21,00,000**
Net Present Value			**11,30,080**

Since NPV is positive, therefore, the project is acceptable.

Evaluation of the project by using Profitability Index Method

Profitability Index = Present Value of Cash Inflows/Present Value of Cash Outflows

= 32,30,080/21,00,000

= 1.538

Since, the profitability index is more than 1, the project is acceptable.

Calculation of THE Project's Payback*.

Year	Net Cash Flow	Cumulative Cash Flow
1	8,96,000	8,96,000
2	8,96,000	17,92,000
3	8,96,000	26,88,000
4	8,96,000	35,84,000
5	8,96,000	44,80,000

Here, the payback period is 2 years plus a fraction of the 3rd year

So, payback period = 2 years + 3,08,000/8,96,000

= 2.34 years

- Payback period may also be solved directly as follows: 21,00,000/8,96,000 = 2.34 years

Project's cash flows and NPV assuming that the book salvage for depreciation purpose is Rs 2,00,000

Depreciation = (Rs 21,00,000 2,00,000)/5 = 3,80,000

Cash Inflows for the years 1 to 5 are:

Savings (calculated as earlier)		22,50,000
Less: Costs		
Depreciation	3,80,000	
Additional Specialists cost	10,00,000	
Maintenance cost	1,50,000	15,30,000
Profit before tax		**7,20,000**
Less: Tax @ 30%		2,16,000
Profit after tax		**5,04,000**
Cash Inflow (5,04,000 + 3,80,000)		**8,84,000**

Calculation of NPV

It may be noted that at the end of year 5, the book value of the project would be Rs 2,00,000 but its realizable value is nil. So, the capital loss of Rs 2,00,000 will result in tax savings of Rs 60,000 (i.e., Rs 2,00,000 x 30%), as the capital loss is available for tax purposes in view of the information given. Therefore, at the end of year 5, there would be an additional inflow of Rs 60,000. The NPV may now be calculated as follows:

Year	Cash Flow (Rs)	PVAF (12%, n)	PV
1-5	8,84,000	3.605	31,86,820
5	60,000	0.567	34,020
PV of inflows			32,20,840
Outflows			21,00,000
NPV			11,20,840

As the NPV of the project is positive, the project is acceptable

Question 14

ICAI SM

Shiva Limited is planning its capital investment programme for next year. It has five projects all of which give a positive NPV at the company cut-off rate of 15 percent, the investment outflows and present values being as follows:

Project	Investment (Rs)	NPV @ 15% (Rs)
A	(50,000)	15,400
B	(40,000)	18,700
C	(25,000)	10,100
D	(30,000)	11,200
E	(35,000)	19,300

The company is limited to a capital spending of Rs 1,20,000.

You are required to ILLUSTRATE the returns from a package of projects within the capital spending limit assuming

a) The projects are independent of each other & divisible (i.e., part project is possible).

b) The projects are not divisible.

Question 14

Projects	Investment	NPV @ 15%	NPV per Rs 1 invested	Ranking
	Rs	Rs		
A	50,000	15,400	0.31	5
B	40,000	18,700	0.47	2
C	25,000	10,100	0.40	3
D	30,000	11,200	0.37	4
E	35,000	19,300	0.55	1

Building up of a Programme of Projects based on their Rankings

Projects	Investment	NPV @ 15%
	Rs	Rs
E	35,000	19,300
B	40,000	18,700
C	25,000	10,100
D	20,000	7,467
	1,20,000	**55,567**

Thus, Project A should be rejected and only two-third of Project D be undertake

However, if the projects are **not divisible** then other combinations can be examined as

Projects	Investment	NPV @ 15%
	Rs	Rs
E + B + C	1,00,000	48,100
E + B + D	1,05,000	49,200

In this case E + B + D would be preferable as it provides a higher NPV despite D ranking lower than C

CA Intermediate – May 2024
Financial Management

Chapter 8
Dividend Decisions

Important Questions

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Question 1 — Gordon's Model

ICAI SM, RTP May 19, MTP Oct 19, Oct 20, Nov 22, Oct 22

The following figures are collected from the annual report of XYZ Ltd.:

Year	Cash flows (Rs.In lakhs)
Net Profit	Rs. 30 lakhs
Outstanding 12% preference shares	Rs. 100 lakhs
No. of equity shares	3 lakhs
Return on Investment	20%
Cost of capital i.e. (Ke)	16%

CALCULATE price per share using Gordon's Model when dividend pay-out is

(i) 25%; (ii) 50% and (iii) 100%.

Solution 1

Year	Rs. In lakhs
Net Profit	30
Less: Preference dividend	12
Earning for equity shareholders	18
Therefore earning per share	18/3 = Rs. 6.00

Price per share according to Gordon's Model is calculated as follows:

$$P_0 = \frac{E_1(1 - b)}{ke - br}$$, Here, $E_1 = 6$, $K_e = 16\%$

i. When dividend pay-out is 25%

$$P_0 = \frac{6 \times 0.25}{0.16 - (0.75 \times 0.2)} = 150$$

ii. When dividend pay-out is 50%

$$P_0 = \frac{6 \times 0.5}{0.16 - (0.5 \times 0.2)} = 50$$

iii. When dividend pay-out is 100%

$$P_0 = \frac{6 \times 1}{0.16 - (0 \times 0.2)} = \frac{6}{0.16} = 37.50$$

Question 2 — Graham & Dodd Model

ICAI has removed this topic, still practice this one question

The dividend payout ratio of H Ltd. is 40%. If the company follows traditional approach to dividend policy with a multiplier of 9, COMPUTE P/E ratio

Solution 2

The P/E ratio i.e. price earnings ratio can be computed with the help of the following formula:

P/E ratio = MPS / EPS

Since the D/P ratio is 40%, D = 40% of E i.e. 0.4E

Hence, Market price per share (P) using Graham & Dodd's model:

$P_0 = m [D + (E/3)]$

$= 9 [0.4E + (E/3)]$

$= 9 [(1.2E + E) / 3]$

$\Rightarrow P_0 = 6.6E$

P/E Ratio = P_0 / E

i.e. P/E ratio is 6.6 times

Question 3 **Linter's Model**

Given the last year's dividend is Rs. 9.80, speed of adjustment of 45%, target payout ratio is 60% and EPS for current year Rs. 20. COMPUTE current year's dividend using Linter's model.

Solution 3

$D_1 = D_0 + [(EPS \times Target\ payout) - D_0] \times Af$

$D_1 = 9.80 + [(20 \times 60\%) - 9.80] \times 0.45$

$D_1 = 9.80 + 0.99 = Rs.\ 10.79$

Question 4 — **Walter's Model**

PYQ Nov 19

Following figures and information were extracted from the company A Ltd.

Earnings of the company	Rs. 10,00,000
Dividend paid	Rs. 6,00,000
No. of shares outstanding	2,00,000
Price Earnings Ratio	10
Rate of return on investment	20%

You are required to calculate:

i. Current Market price of the share

ii. Capitalisation rate of its risk class

iii. What should be the optimum pay-out ratio?

iv. What should be the market price per share at optimal pay-out ratio? (use Walter's Model)

Solution 4

i. Current Market price of shares (applying Walter's Model)

- The EPS of the firm is Rs. 5 (i.e., Rs 10,00,000 / 2,00,000).
- Rate of return on Investment (r) = 20%.
- The Price Earnings (P/E) Ratio is given as 10, so capitalization rate (Ke), may be taken at the inverse of P/E Ratio. Therefore, Ke is 10% or .10 (i.e., 1/10).
- The firm is distributing total dividends of Rs. 6,00,000 among 2,00,000 shares, giving a dividend per share of Rs. 3.

The value of the share as per Walter's model may be found as follows: Walter's model is given by

$$P = \frac{D+(E-D)(r / Ke)}{Ke}$$

Where,

P = Market price per share.

E = Earnings per share = Rs. 5

D = Dividend per share = Rs. 3

R = Return earned on investment = 20 %

Ke = Cost of equity capital = 10% or .10

	The value of the share as per Walter's model may be found as follows: Walter's model is given by
	$P = \frac{3+(5-3)(0.20/0.10)}{0.10} = Rs.\ 70$
	Current Market Price of shares can also be calculated as follows:
	Price Earnings (P/E) Ratio = $\frac{\text{Market Price of Share}}{\text{Earnings per Shares}}$
	Or, 10 = $\frac{\text{Market Price of Share}}{\text{Rs. 10,00,000 / 2,00,000}}$
	Or, 10 = $\frac{\text{Market Price of Share}}{\text{Rs. 5}}$
	Market Price of Share = Rs. 50
ii.	Capitalization rate (Ke) of its risk class is 10% or .10 (i.e., 1/10).
iii.	Optimum dividend pay-out ratio
	According to Walter's model when the return on investment is more than the cost of equity capital (10%), the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is nil or 0 (zero).
iv.	Market price per share at optimum dividend pay-out ratio
	At a pay-out ratio of zero, the market value of the Company's share will be:
	$P = \frac{0+(5-0)(0.20/0.10)}{0.10} = Rs.\ 100$

Question 5 — **Walter's Model**

ICAI SM, RTP May 21, MTP Apr 19, Nov 21

Total Earnings	Rs 2,00,000
No. of equity shares (of Rs. 100 each)	20,000

Dividend paid	Rs 1,50,000
Price/ Earnings ratio	12.5

i. ANALYSE whether the company is following an optimal dividend policy.

ii. COMPUTE P/E ratio at which the dividend policy will have no effect on the value of the share.

iii. Will your decision change if the P/E ratio is 8 instead of 12.5? ANALYSE.

Solution 5

i. The EPS of the firm is Rs. 10 (i.e., Rs. 2,00,000/ 20,000) and r = 2,00,000/ (20,000 shares × Rs. 100) = 10%. The P/E Ratio is given at 12.5 and the cost of capital, Ke, may be taken at the inverse of P/E ratio. Therefore, Ke is 8 (i.e., 1/12.5). The firm is distributing total dividends of Rs. 1,50,000 among 20,000 shares, giving a dividend per share of Rs. 7.50. the value of the share as per Walter's model may be found as follows:

$$P = \frac{D + (E-D)(r / Ke)}{Ke} = \frac{7.5 + (10 - 7.5)(0.1/0.08)}{0.08} = \text{Rs. } 132.81$$

The firm has a dividend payout of 75% (i.e., Rs. 1,50,000) out of total earnings of Rs. 2,00,000. Since, the rate of return of the firm, r, is 10% and it is more than the Ke of 8%, therefore, by distributing 75% of earnings, the firm is not following an optimal dividend policy. The optimal dividend policy for the firm would be to pay zero dividend and in such a situation, the market price would be-

$$\frac{0 + (10 - 0)(0.1/0.08)}{0.08} = \text{Rs. } 156.25$$

So, theoretically the market price of the share can be increased by adopting a zero payout

ii. The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the Ke would be equal to the rate of return, r, of the firm. The Ke would be 10% (= r) at the P/E ratio of 10. Therefore, at the P/E ratio of 10, the dividend policy would have no effect on the value of the share.

iii. If the P/E is 8 instead of 12.5, then the Ke which is the inverse of P/E ratio, would be 12.5 and in such a situation ke> r and the market price, as per Walter's model would be:

$$P = \frac{D + (E - D)(r / Ke)}{Ke} = \frac{7.5 + (10 - 7.5)(0.1/0.125)}{0.125} = \text{Rs. } 76$$

Question 6 — **Intrinsic Value**

ICAI SM, PYQ Dec 21

X Ltd. is a multinational company. Current market price per share is Rs 2,185. During the F.Y. 2020-21, the company paid Rs 140 as dividend per share. The company is expected to grow @ 12% p.a. for next four years, then 5% p.a. for an indefinite period. Expected rate of return of shareholders is 18% p.a.

i. Find out intrinsic value per share.

ii. State whether shares are overpriced or underpriced.

Year	1	2	3	4	5
Discount Factor @ 18%	0.847	0.718	0.608	0.515	0.436

Solution 6

As per Dividend discount model, the price of share is calculated as follows:

$$P= \frac{D1}{(1+Ke)^1} + \frac{D2}{(1+Ke)^2} + \frac{D3}{(1+Ke)^3} + \frac{D4}{(1+Ke)^4} + \frac{D4(1+g)}{(Ke-g)} \times \frac{1}{(1+Ke)^4}$$

Where,

P = Price per share

Ke = Required rate of return on equity

g = Growth rate

$$P = \frac{Rs\ 140 \times 1.12}{(1+0.18)^1} + \frac{Rs\ 156.80 \times 1.12}{(1+0.18)^2} + \frac{Rs\ 175.62 \times 1.12}{(1+0.18)^3} +$$

$$\frac{Rs\ 196.69 \times 1.12}{(1+0.18)^4} + \frac{Rs\ 220.29\ (1+0.05)}{(0.18-0.05)} \times \frac{1}{(1+0.18)^4}$$

P= **132.81 + 126.10 + 119.59 + 113.45 + 916.34 = Rs 1,408.29**

Intrinsic value of share is Rs 1,408.29 as compared to latest market price of Rs 2,185.

Market price of share is over-priced by Rs 776.71.

Question 7 — **Dividend Discount Model – Constant Growth**

ICAI SM

In May 2020, shares of RT Ltd. was sold for Rs. 1,460 per share. A long term earnings growth rate of 7.5% is anticipated. RT Ltd. is expected to pay dividend of Rs. 20 per share.

i. CALCULATE rate of return an investor can expect to earn assuming that dividends are expected to grow along with earnings at 7.5% per year in perpetuity?

ii. It is expected, RT Ltd. will earn about 10% on retain earnings & shall retain 60% of earnings. In this case, STATE whether, there would be any change in growth rate & cost of Equity?

Solution 7

i. According to Dividend Discount Model approach, the firm's expected or required return on equity is computed as follows:

$$Ke = \frac{D_1}{P_0} + g = \frac{20\ (1 + 0.075)}{1,460} + 7.5\% = 0.0147 + 0.075 = 0.0897 \text{ or } 8.97\%$$

ii. With rate of return on retained earnings (r) is 10% and retention ratio (b) is 60%, new growth rate will be as follows:

$g = br = 0.10 \times 0.60 = 0.06$

Accordingly, dividend will also get changed and to calculate this, first we shall calculate previous retention ratio (b1) and then EPS assuming that rate of return on retained earnings (r) is same.

With previous Growth Rate of 7.5% and r =10%, the retention ratio comes out to be:

$0.075 = b1 \times 0.10$, b1 = 0.75 and payout ratio = 0.25

With 0.25 payout ratio the EPS will be as follows:

Rs. 20/0.25 = Rs. 80

With new 0.40 (1 – 0.60) payout ratio, the new dividend will be

D1 = Rs. 80 × 0.40 = Rs. 32

Accordingly, new Ke will be

Ke = 32/1460 + 6%, OR Ke = 8.19%

Question 8

Newly added Que in ICAI SM of New Syllabus

Mr H is currently holding 1,00,000 shares of HM ltd, and currently the share of HM ltd is trading on Bombay Stock Exchange at Rs. 50 per share. Mr A have a policy to re-invest the amount of any dividend received into the share back again of HM ltd. If HM ltd has declared a dividend of Rs. 10 per share, please determine the no of shares that Mr A would hold after he re-invests dividend in shares of HM ltd.

Solution 8

Ex-dividend price is Rs. 40 (50-10).

The total amount of dividend received is Rs. 10,00,000 which is re-invested at the rate of Rs. 40 per share.

Hence additional shares purchased would be 25,000.

Total holding would be 1,25,000 shares (1,00,000 + 25,000)

Question 9

Newly added Que in ICAI SM of New Syllabus

Following information is given pertaining to DG ltd,

No of shares outstanding	1 lakh shares
Earnings Per share	25 per share
P/E Ratio	20
Book Value per share	400 per share

If company decides to repurchase 25,000 shares, at the prevailing market price, what is the resulting book value per share after repurchasing.

Solution 9

Current Market price = 20 x 25 = 500 per share

Book value of the company before repurchase = Rs. 4 cr (400 x 1 lakh shares)

Amount paid for repurchase = 1.25 cr (25,000 shares x 500 per share)

Book Value of company after repurchase = Rs. 2.75 cr (4cr – 1.25cr)

No of shares after repurchase = 75,000 shares

Book value per share = 367 per share.

Question 10 — MM Model

ICAI SM

AB Engineering Ltd. belongs to a risk class for which the capitalization rate is 10%. It currently has outstanding 10,000 shares selling at Rs. 100 each. The firm is contemplating the declaration of a dividend of Rs. 5 share at the end of the current financial year. It expects to have a net income of Rs. 1,00,000 and has a proposal for making new investments of Rs. 2,00,000. CALCULATE the value of the firm when dividends

(i) are not paid

(ii) are paid.

Solution 10

CASE 1: Value of the firm when dividends are not paid.

Step 1: Calculate price at the end of the period

$K_e = 10\%$, $P_0 = 100$, $D_1 = 0$

$$P_0 = \frac{P_1 + D_1}{1 + K_e} \Rightarrow 100 = \frac{P_1 + 0}{1 + 0.10} \Rightarrow P_1 = 110$$

Step 2: Calculation of funds required for investment

Earning	Rs. 1,00,000
Dividend distributed	Nil
Fund available for investment	Rs. 1,00,000
Total Investment	Rs. 2,00,000
Balance Funds required	Rs. 2,00,000 - Rs. 1,00,000 = Rs. 1,00,000

Step 3: Calculation of No. of shares required to be issued for balance funds

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)} \Rightarrow \Delta n = \frac{1,00,000}{110}$$

Step 4: Calculation of value of firm

$$nP_o = \frac{(n + \Delta n)P_1 - I + E}{1 + K_e}$$

$$nP_o = \frac{\left(10,000 + \frac{\text{Rs. } 1,00,000}{\text{Rs. } 110}\right) \times \text{Rs. } 110 - 2,00,000 + 1,00,000}{(1+0.10)} = \text{Rs. } 10,00,000$$

CASE 2: Value of the firm when dividends are paid.

Step 1: Calculate price at the end of the period

Ke = 10%, P_o= 100, D_1= 5

$$P_o = \frac{P_1 + D_1}{1 + K_e} \Rightarrow 100 = \frac{P_1 + 5}{1 + 0.10} \Rightarrow P_1 = 105$$

Step 2: Calculation of funds required for investment

Earning	Rs. 1,00,000
Dividend distributed	Rs. 50,000
Fund available for investment	Rs. 50,000
Total Investment	Rs. 2,00,000
Balance Funds required	Rs. 2,00,000 - Rs. 50,000 = Rs. 1,50,000

Step 3: Calculation of No. of shares required to be issued for balance fund

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)} \Rightarrow \Delta n = \frac{\text{Rs. } 1,50,000}{\text{Rs. } 105}$$

Step 4: Calculation of value of firm

$$nP_o = \frac{(n + \Delta n)P_1 - I + E}{1 + K_e}$$

$$nP_o = \frac{\left(10,000 + \frac{\text{Rs. } 1,50,000}{\text{Rs. } 105}\right) \times \text{Rs. } 105 - \text{Rs. } 2,00,000 + \text{Rs. } 1,00,000}{(1+0.10)}$$

= Rs. 10,00,000

Thus, it can be seen from the above illustration that the value of the firm remains the same in either case.

CA Intermediate – May 2024
Financial Management

Chapter 9
Management of Working Capital

Unit 1- Introduction to Working Capital Management

Important Questions

By CA Mohnish Vora (MVSIR)

Official website for books of MVSIR– www.mvsir.in

Question 1 **Unit 1 - Working Capital Requirement & Baumol's model**

ICAI SM, MTP Apr 22, PYQ Nov 20

The following annual figures relate to manufacturing entity

Sales at one month credit	84,00,000
Material consumption	60% of sales value
Wages (paid in a lag of 15 days)	12,00,000
Cash Manufacturing Expenses	3,00,000
Administrative Expenses	2,40,000
Creditors extend 3 months credit for payment.	
Cash manufacturing and administrative expenses are paid 1 months in arrear.	

- The company maintains stock of raw material equal to economic order quantity.
- The company incurs Rs. 100 as per ordering cost per order & cost of capital is 15% p.a.
- The optimum cash balance is determined using Baumol's model.
- The bank charges Rs. 10 for each cash withdrawal.
- Finished goods are held in stock for 1 month.
- The company maintains a bank balance of Rs.12,00,000 on an average.
- Creditors are paid through net banking and all other expenses are incurred in cash which is withdrawn from bank.

Assuming a 20% safety margin, you are required to ESTIMATE the amount of working capital that needs to be invested by the Company.

Solution 1

Preparation of Statement of Working Capital Requirement

	(Amount in Rs.)	(Amount in Rs.)
A. Current Assets		
Stock of Raw Material (W.N. 2)	81,975	
Stock of finished Goods $\left(\frac{\text{Rs. } 65,40,000}{12 \text{ months}} \times 1 \text{ month}\right)$	5,45,000	
Average Receivables (at Cost) $\left(\frac{\text{Rs. } 67,80,000}{12 \text{ months}} \times 1 \text{ month}\right)$	5,65,000	
Bank Balance	12,00,000	
Cash Balance (W.N. 3)	15,232	
Gross Working Capital		24,07,207
B. Current Liabilities		
Average Creditor for materials $\left(\frac{\text{Rs. } 50,40,000}{12 \text{ months}} \times 3 \text{ months}\right)$	12,60,000	
Outstanding Wages $\left(\frac{\text{Rs. } 12,00,000}{12 \text{ months}} \times 0.5 \text{ month}\right)$	50,000	
Outstanding Cash Manufacturing Expenses $\left(\frac{\text{Rs. } 3,00,000}{12 \text{ months}} \times 1 \text{ month}\right)$	25,000	
Outstanding administrative Expenses $\left(\frac{\text{Rs. } 2,40,000}{12 \text{ months}} \times 1 \text{ month}\right)$	20,000	
		13,55,000
Net Working Capital (A-B)		10,52,207
Add: Safety Margin @ 20%		2,10,441
Total Working Capital Requirement		**12,62,648**

Working Notes:

1. Computation of annual cash Cost of Production & Sales

Material Consumed (84,00,000 × 60%)	50,40,000
Wages	12,00,000
Manufacturing expenses	3,00,000
Cash Cost of production	**65,40,000**
(+) Administrative Expenses	2,40,000
Cash Cost of Sales	**67,80,000**

2. Computation of stock of Raw Material

$A = 50,40,000$,$B = 100$,$C = 0.15$

$$EOQ = \sqrt{\frac{2AB}{C}} = \sqrt{\frac{2 \times 50,40,000 \times 100}{0.15}} = \text{Rs. } 81,975$$

3. Calculation of Cash Balance

$A = 12,00,000+3,00,000+2,40,000$

$A = 17,40,000$,$B = 10$,$C = 0.15$

$$\text{Optimal Cash Balance} = \sqrt{\frac{2AB}{C}} = \sqrt{\frac{2 \times 17,40,000 \times 10}{0.15}} = \text{Rs. } 15,232$$

Question 2 **Unit 1 - Working Capital Requirement (Double Shift Working)**

ICAI SM, RTP May 21

MT Ltd. has been operating its manufacturing facilities till 31.3.2021 on a single shift working with the following cost structure:

	Per unit (Rs.)
Cost of Materials	24
Wages (out of which 60% variable)	20
Overheads (out of which 20% variable)	20
	64
Profit	8
Selling Price	72

As at 31.3.2021 with sales of Rs 17,28,000, the company held :	Per unit (Rs.)
Stock of raw materials (at cost)	1,44,000
Work-in-progress (valued at prime cost)	88,000
Finished goods (valued at total cost)	2,88,000
Sundry debtors	4,32,000

In view of increased market demand, it is proposed to double production by working an extra shift. It is expected that a 10% discount will be available from suppliers of raw materials in view of increased volume of business. Selling price will remain the same. The credit period allowed to customers will remain unaltered. Credit availed from suppliers will continue to remain at the present level i.e. 2 months. Lag in payment of wages and overheads will continue to remain at one month.

You are required to CALCULATE the additional working capital requirements, if the policy to increase output is implemented, to assess the impact of double shift for long term as a matter of production policy.

Solution 2

1. Statement of cost at single shift and double shift working

	24,000 units		48,000 Units	
	Per unit (Rs.)	Total (Rs.)	Per unit (Rs.)	Total (Rs.)
Raw materials	24	5,76,000	21.6	10,36,000
Wages:				
Variable	12	2,88,000	12	5,76,000
Fixed	8	1,92,000	4	1,92,000
Overheads:				
Variable	4	96,000	4	1,92,000
Fixed	16	3,84,000	8	3,84,000
Total cost	64	15,36,000	49.6	23,80,800
Profit	8	1,92,000	22.4	10,75,200
Sales	72	17,28,000	72	34,56,000

2. Sales in units 2020-21 = $\frac{\text{Sales}}{\text{Unit selling price}} = \frac{\text{Rs. 17,28,000}}{\text{Rs. 72}}$ = 24,000 units

3. Stock of Raw Materials in units on 31.3.2021

$\frac{\text{Value of stock}}{\text{Cost per unit}} = \frac{\text{Rs. 1,44,000}}{\text{Rs. 24}}$ = 6,000 units

4. Stock of work-in-progress in units on 31.3.2021

$\frac{\text{Value of work-in-progress}}{\text{Prime Cost per unit}} = \frac{\text{Rs. 88,000}}{\text{Rs.(24 + 20)}}$ = 2,000units

5. Stock of finished goods in units 2020-21

$\frac{\text{Value of stock}}{\text{Total Cost per unit}} = \frac{\text{Rs. 2,88,000}}{\text{Rs. 64}}$ = 4,500 units

Comparative Statement of Working Capital Requirement

	Single Shift (24,000 units)			Double Shift (48,000 units)		
	Units	Rate (Rs.)	Amount (Rs.)	Units	Rate (Rs.)	Amount (Rs.)
Current Assets						
Inventories						
Raw Materials	6,000	24	1,44,000	12,000	21.6	2,59,200
Work-in-Progress	2,000	44	88,000	2,000	37.6	75,200
Finished Goods	4,500	64	2,88,000	9,000	49.6	4,46,400
Sundry Debtors	6,000	64	3,84,000	12,000	49.6	5,95,200
Total Current Assets (A)			9,04,000			13,76,000
Current Liabilities						
Creditors for Materials	4,000	24	96,000	8,000	21.6	1,72,800
Creditors for Wages	2,000	20	40,000	4,000	16	64,000
Creditors for Overheads	2,000	20	40,000	4,000	12	48,000
Total Current Liabilities (B)			1,76,000			2,84,800
Working Capital (A) – (B)			**7,28,000**			**10,91,200**

Analysis: Additional Working Capital requirement = Rs. 10,91,200 – Rs. 7,28,000 = Rs. 3,63,200, if the policy to increase output is implemented.

Question 3 — **Unit 1 - Operating Cycle**

MTP May 20

The following information is provided by MNP Ltd. for the year ending 31st March, 2020:

Raw Material Storage period 45 days

Work-in-Progress conversion period 20 days

Finished Goods storage period 25 days, Debt Collection period 30 days

Creditors payment period 60 days, Annual Operating Cost Rs. 25,00,000

(Including Depreciation of Rs. 2,50,000) , Assume 360 days in a year.

You are required to calculate

i. Operating Cycle period

ii. Number of Operating Cycle in a year.

iii. Amount of working capital required for the company on a cost basis.

iv. The company is a market leader in its product and it has no competitor in the market. Based on a market survey it is planning to discontinue sales on credit and deliver products based on pre-payments in order to reduce its working capital requirement substantially. You are required to compute the reduction in working capital requirement in such a scenario.

Solution 3

i. **Calculation of Operating Cycle Period:**

Operating Cycle Period = R + W + F + D – C

= 45 + 20 + 25 + 30 – 60 = 60 days

ii. **Number of Operating Cycle in a Year** = $\frac{360}{\text{Operating Cycle Period}} = \frac{360}{60} = 6$

iii. **Amount of Working Capital Required**

$$\frac{\text{Annual operating cost}}{\text{Number of operating cycle}} = \frac{\text{Rs. 25,00,000 – Rs. 2,50,000}}{6} = \frac{\text{Rs. 22,50,000}}{6}$$

= Rs. 3,75,000

iv. **Reduction in Working Capital**

Operating Cycle Period = R + W + F – C = 45 + 20 + 25 – 60 = 30 days

Amount of Working Capital Required = $\frac{\text{Rs. 22,50,000}}{6} \times 30$ = Rs. 1,87,500

Reduction in Working Capital = Rs. 3,75,000 – Rs. 1,87,500 = Rs. 1,87,500

Note: If we use Total Cost basis, then amount of Working Capital required will be Rs. 4,16,666.67 (approx.) and Reduction in Working Capital will be Rs. 2,08,333.33 (approx.)

Question 4 **Unit 1 - Working Capital Requirement**

PYQ May 19

Bita Limited manufactures used in the steel industry. The following information regarding the company is given for your consideration:

a) Expected level of production 9000 units per annum.

b) Raw materials are expected to remain in store for an average of two months before issue to production.

c) Work-in-progress (50 percent complete as to conversion cost) will approximate to $\frac{1}{2}$ month's production.

d) Finished goods remain in warehouse on an average for one month.

e) Credit allowed by suppliers is one month.

f) Two month's credit is normally allowed to debtors.

g) A minimum cash balance of Rs. 67,500 is expected to be maintained.

h) Cash sales are 75 percent less than the credit sales.

i) Safety margin of 20 percent to cover unforeseen contingencies.

j) The production pattern is assumed to be even during the year.

k) The cost structure for Bita Limited's product is as follows:

	(Amount in Rs.)
Raw Materials	80 per unit
Direct Labour	20 per unit
Overheads (including depreciation Rs. 20)	80 per unit
Total Cost	180 per unit
Profit	20 per unit
Selling Price	200 per unit

You are required to estimate the working capital requirement of Bita limited.

Solution 4

Statement showing Estimate of Working Capital Requirement

	(Amount in Rs.)	(Amount in Rs.)
A. Current Assets		
(i) Inventories:		
Raw material inventory $\left(\frac{9{,}000\text{units} \times \text{Rs. } 80}{12\text{ months}} \times 2\text{ months}\right)$		1,20,000
Work in Progress:		
Raw material $\left(\frac{9{,}000\text{units} \times \text{Rs. } 80}{12\text{ months}} \times 0.5\text{ month}\right)$	30,000	
Wages $\left(\frac{9{,}000\text{units} \times \text{Rs. } 20}{12\text{ months}} \times 0.5\text{ month}\right) \times 50\%$	3,750	
Overheads $\left(\frac{9{,}000\text{units} \times \text{Rs. } 60}{12\text{ months}} \times 0.5\text{ month}\right) \times 50\%$ (Other than Depreciation)	11,250	45,000
Finished goods (inventory held for 1 months) $\left(\frac{9{,}000\text{units} \times \text{Rs. } 160}{12\text{ months}} \times 1\text{ month}\right)$		1,20,000
(ii) Debtors (for 2 months) $\left(\frac{9{,}000\text{units} \times \text{Rs. } 160}{12\text{ months}} \times 2\text{ months}\right) \times 80\%$ or $\left(\frac{11{,}52{,}000}{12\text{ months}} \times 2\text{ months}\right)$		1,92,000
(iii) Cash balance expected		67,500
Total Current assets		5,44,500

Statement showing Estimate of Working Capital Requirement

	(Amount in Rs.)	(Amount in Rs.)
B. Current Liabilities		
(i) Creditors for Raw material (1 month) $\left(\frac{9{,}000\text{units} \times \text{Rs. } 80}{12 \text{ months}} \times 1 \text{ month}\right)$		60,000
Total current liabilities		60,000
Net working capital (A – B)		4,84,500
Add: Safety margin of 20 percent		96,900
Working capital Requirement		5,81,400

1. If Credit sales is x then cash sales is x-75% of x i.e. x/4.
   Or x+0.25x = Rs. 18,00,000
   Or x=Rs. 14,40,000
   So, credit Sales is Rs. 14,40,000

   Hence, Cash cost of credit sales $\left(\frac{\text{Rs. } 14{,}40{,}000}{12 \text{ months}} \times 4\right)$ = Rs. 11,52,000

2. It is assumed that safety margin of 20% is on net working capital
3. No information is given regarding lag in payment of wages, hence ignored assuming it is paid regularly.
4. Debtors/Receivables is calculated based on total cost.
   [If Debtors/Receivables is calculated based on sales, then debtors will be
   $\left(\frac{9{,}000\text{units} \times \text{Rs.}200}{12 \text{ months}} \times 1 \text{ month}\right) \times 80\%$ or
   $\left(\frac{14{,}40{,}000}{12 \text{ months}} \times 2 \text{ months}\right)$ = Rs. 2,40,000
   Then Total Current assets will be Rs. 5,92,500 and accordingly Net working capital and Working capital requirement will be Rs. 5,32,500aand Rs. 6,39,000 respectively].

Question 5 **Unit 1 - Working Capital Requirement**

PYQ May 18

Day Ltd., a newly formed company has applied to the Private Bank for the first time for financing it's Working Capital Requirements. The following informations are available about the projections for the current year:

Estimated Level of Activity	Completed Units of Production 31200 plus unit of work in progress 12000
Raw Material Cost	Rs. 40 per unit
Direct Wages Cost	Rs. 15 per unit
Overhead	Rs. 40 per unit (inclusive of Depreciation Rs.10 per unit)
Selling Price	Rs. 130 per unit
Raw Material in Stock Average	30 days consumption
Work in Progress Stock	Material 100% and Conversion Cost 50%
Finished Goods Stock	24000 Units
Credit Allowed by the supplier	30 days
Credit Allowed to Purchasers	60 days
Direct Wages (Lag in payment)	15 days
Expected Cash Balance	Rs. 2,00,000

Assume that production is carried on evenly throughout the year (360 days) and wages and overheads accrue similarly. All sales are on the credit basis.

You are required to calculate the Net Working Capital Requirement on Cash Cost Basis.

Solution 5

Calculation of Net Working Capital requirement

	(Amount in Rs.)	(Amount in Rs.)
A. Current Assets		
Inventories:		
Stock of Raw material (Refer to Working note (iii)	1,44,000	
Stock of Work in progress (Refer to Working note (ii)	7,50,000	
Stock of Finished goods (Refer to Working note (iv)	20,40,000	
Debtors for Sales (Refer to Working note (v)	1,02,000	
Cash	2,00,000	
Gross Working Capital	32,36,000	32,36,000

	(Amount in Rs.)	(Amount in Rs.)
B. Current Liabilities:		
Creditors for Purchases (Refer to Working note (vi)	1,56,000	
Creditors for wages (Refer to Working note (vii)	23,250	
	1,79,250	1,79,250
Net Working Capital (A - B)		**30,56,750**

Working Notes:

(i) Annual cost of production

	(Rs.)
Raw material requirements {(31,200 × Rs. 40) + (12,000 x Rs. 40)}	17,28,000
Direct wages {(31,200 ×Rs. 15) +(12,000 X Rs. 15 x 0.5)}	5,58,000
Overheads (exclusive of depreciation) {(31,200 × Rs. 30) + (12,000 x Rs. 30 x 0.5)}	11,16,000
Gross Factory Cost	34,02,000
Less: Closing W.I.P [12,000 (Rs. 40 + Rs. 7.5 + Rs.15)]	(7,50,000)
Cost of Goods Produced	26,52,000
Less: Closing Stock of Finished Goods (Rs. 26,52,000 × 24,000/31,200)	(20,40,000)
Total Cash Cost of Sales	**6,12,000**

(ii) Work in progress stock

	(Rs.)
Raw material requirements (12,000 units × Rs.40)	4,80,000
Direct wages (50% × 12,000 units × Rs. 15)	90,000
Overheads (50% × 12,000 units × Rs. 30)	1,80,000
	7,50,000

(iii) It is given that raw material in stock is average 30 days consumption. Since, the company is newly formed; the raw material requirement for production and work in progress will be issued and consumed during the year.

Hence, the raw material consumption for the year (360 days) is as follows:

	(Rs.)
For Finished goods (31,200 × Rs. 40)	12,48,000
For Work in progress (12,000 × Rs. 40)	4,80,000
	17,28,000

Raw material stock = $\frac{\text{Rs. 17,28,000}}{\text{360 days}}$ x 30 days = Rs. 1,44,000

(iv) Finished goods stock:

24,000 units @ Rs. (40+15+30) per unit = Rs.20,40,000

(v) Debtors for sale:

Rs. 6,12,000 x $\frac{\text{60 days}}{\text{360 days}}$ = Rs. 1,02,000

(vi) Creditors for raw material Purchases [Refer Working Note (iii)]:

	(Rs.)
Annual Material Consumed (Rs.12,48,000 + Rs.4,80,000)	17,28,000
Add: Closing stock of raw material	1,44,000
	18,72,000

Credit allowed by suppliers = $\frac{\text{Rs. 18,72,000}}{\text{360 days}}$ x 30 days = Rs. 1,56,000

(vii) Creditors for wages:

Outstanding wage payment = $\frac{\text{Rs. 5,58,000}}{\text{360 days}}$ x 15 days = Rs. 23,250

CA Intermediate – May 2024
Financial Management

Chapter 9
Management of Working Capital

Unit 2- Treasury and Cash Management

Important Questions

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Official website for books of MVSIR– www.mvsir.in

Question 6 **Unit 2 - Cash Budget**

ICAI SM, MTP Oct 19, Mar 23

You are given the following information:

i. Estimated monthly Sales are as follows:

	(Rs.)		(Rs.)
January	1,00,000	June	80,000
February	1,20,000	July	1,00,000
March	1,40,000	August	80,000
April	80,000	September	60,000
May	60,000	October	1,00,000

ii. Wages and Salaries are estimated to be payable as follows:

	(Rs.)		(Rs.)
April	9,000	July	10,000
May	8,000	August	9,000
June	10,000	September	9,000

iii. Of the sales, 80% is on credit and 20% for cash. 75% of the credit sales are collected within one month and the balance in two months. There are no bad debt losses.

iv. Purchases amount to 80% of sales and are made and paid for in the month preceding the sales.

v. The firm has taken a loan of Rs.1,20,000. Interest @ 10% p.a. has to be paid quarterly in January, April and so on.

vi. The firm is to make payment of tax of Rs. 5,000 in July, 2019.

vii. The firm had a cash balance of Rs. 20,000 on 1St April, 2019 which is the minimum desired level of cash balance. Any cash surplus/deficit above/below this level is made up by temporary investments/liquidation of temporary investments or temporary borrowings at the end of each month (interest on these to be ignored).

Required

PREPARE monthly cash budgets for six months beginning from April, 2019 on the basis of the above information.

Solution 6

Computation – Collections from Debtors

Particulars	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Total Sales	1,20,000	1,40,000	80,000	60,000	80,000	1,00,000	80,000	60,000
Credit Sales (80% of total Sales)	96,000	1,12,000	64,000	48,000	64,000	80,000	64,000	48,000
Collection (within one month)		72,000	84,000	48,000	36,000	48,000	60,000	48,000
Collection (within two months)			24,000	28,000	16,000	12,000	16,000	20,000
Total Collections			1,08,000	76,000	52,000	60,000	76,000	68,000

Monthly Cash Budget for Six Months: April to September, 2019

Particulars	Apr	May	Jun	Jul	Aug	Sep
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Receipts:						
Opening Balance	20,000	20,000	20,000	20,000	20,000	20,000
Cash Sales	16,000	12,000	16,000	20,000	16,000	12,000
Collections from Debtors	1,08,000	76,000	52,000	60,000	76,000	68,000
Total Receipts (A)	1,44,000	1,08,000	88,000	1,00,000	1,12,000	1,00,000
Payments:						
Purchases	48,000	64,000	80,000	64,000	48,000	80,000
Wages and Salaries	9,000	8,000	10,000	10,000	9,000	9,000
Interest on Loan	3,000	-----	-----	3,000	-----	-----
Tax Payment	-----	-----	-----	5,000	-----	-----
Total Payment (B)	60,000	72,000	90,000	82,000	57,000	89,000
Minimum Cash Balance	20,000	20,000	20,000	20,000	20,000	20,000
Total Cash Required (C)	80,000	92,000	1,10,000	1,02,000	77,000	1,09,000
Surplus/ (Deficit) (A)-(C)	64,000	16,000	(22,000)	(2,000)	35,000	(9,000)
Investment/Financing: Total effect of (Invest)/ Financing (D)	(64,000)	(16,000)	22,000	2,000	(35,000)	9,000
Closing Cash Balance (A) + (D) - (B)	20,000	20,000	20,000	20,000	20,000	20,000

Question 7 **Unit 2 - Cleared Funds Forecast**

ICAI SM

Prachi Ltd is a manufacturing company producing and selling a range of cleaning products to wholesale customers. It has three suppliers and two customers. Prachi Ltd relies on its cleared funds forecast to manage its cash.

You are an accounting technician for the company and have been asked to prepare a cleared funds forecast for the period Saturday 7 August to Wednesday 11 August 2021 inclusive. You have been provided with the following information:

1. Receipts from customers

	Credit terms	Payment method	7 Aug 2021 sales	7 Jul 2021 sales
W Ltd	1 calendar month	BACS	Rs. 150,000	Rs. 130,000
X Ltd	None	Cheque	Rs. 180,000	Rs. 160,000

a) Receipt of money by BACS (Banker's Automated Clearing Services) is instantaneous.

b) X Ltd's cheque will be paid into Prachi Ltd's bank account on the same day as the sale is made and will clear on the third day following this (excluding day of payment).

2. Payments to suppliers

Supplier name	Credit terms	Payment method	7 Aug 2021 purchases	7 Jul 2021 purchases	7 Jun 2021 purchases
A Ltd	1 calendar month	Standing order	Rs. 65,000	Rs. 55,000	Rs. 45,000
B Ltd	2 calendar months	Cheque	Rs. 85,000	Rs. 80,000	Rs. 75,000
C Ltd	None	Cheque	Rs. 95,000	Rs. 90,000	Rs. 85,000

a) Prachi Ltd has set up a standing order for Rs. 45,000 a month to pay for supplies from A Ltd. This will leave Prachi's bank account on 7 August. Every few months, an adjustment is made to reflect the actual cost of supplies purchased (you do NOT need to make this adjustment)

b) Prachi Ltd will send out, by post, cheques to B Ltd and C Ltd on 7 August. The amounts will leave its bank account on the second day following this (excluding the day of posting).

3. Wages and salaries

	July 2021	August 2021
Weekly wages	Rs. 12,000	Rs. 13,000
Monthly salaries	Rs. 56,000	Rs. 59,000

a) Factory workers are paid cash wages (weekly). They will be paid one week's wages, on 11 August, for the last week's work done in July (i.e. they work a week in hand).

b) All the office workers are paid salaries (monthly) by BACS. Salaries for July will be paid on 7 August.

4. Other miscellaneous payments

a) Every Saturday morning, the petty cashier withdraws Rs. 200 from the company bank account for the petty cash. The money leaves Prachi's bank account straight away.

b) The room cleaner is paid Rs. 30 from petty cash every Monday morning.

c) Office stationery will be ordered by telephone on Sunday 8 August to the value of Rs. 300. This is paid for by company debit card. Such payments are generally seen to leave the company account on the next working day.

d) Five new softwares will be ordered over the Internet on 10 August at a total cost of Rs. 6,500. A cheque will be sent out on the same day. The amount will leave Prachi Ltd's bank account on the second day following this (excluding the day of posting).

5. Other information

The balance on Prachi's bank account will be Rs. 200,000 on 7 August 2021. This represents both the book balance and the cleared funds.

PREPARE a cleared funds forecast for the period Saturday 7th Aug to Wednesday 11th Aug 2021 inclusive using the information provided. Show clearly uncleared funds float each day.

Solution 7

Cleared Funds Forecast

	7 Aug 21 (Saturday)	8 Aug 21 (Sunday)	9 Aug 21 (Monday)	10 Aug 21 (Tuesday)	11 Aug 21 (Wednesday)
Receipts					
W Ltd	1,30,000	0	0	0	0
X Ltd	0	0	0	1,80,000	0
(a)	1,30,000	0	0	1,80,000	0
Payments					
A Ltd	45,000	0	0	0	0
B Ltd	0	0	75,000	0	0
C Ltd	0	0	95,000	0	0
Wages	0	0	0	0	12,000
Salaries	56,000	0	0	0	0
Petty Cash	200	0	0	0	0
Stationery	0	0	300	0	0
(b)	1,01,200	0	1,70,300	0	12,000
Cleared excess Receipts over payments (a) – (b)	28,800	0	(1,70,300)	1,80,000	(12,000)
Cleared bal b/f	2,00,000	2,28,800	2,28,800	58,500	2,38,500
Cleared bal c/f (c)	**2,28,800**	**2,28,800**	**58,500**	**2,38,500**	**2,26,500**
Uncleared funds float					
Receipts	1,80,000	1,80,000	1,80,000	0	0
Payments	(1,70,000)	(1,70,300)	0	(6,500)	(6,500)
(d)	10,000	9,700	1,80,000	(6,500)	(6,500)
Total book bal c/f [c+d]	**2,38,800**	**2,38,500**	**2,38,500**	**2,32,000**	**2,20,000**

Notes :

Question 8 **Unit 2 - Cash Budget**

PYQ Dec 21

A garment trader is preparing cash forecast for first three months of calendar year 2021. His estimated sales for the forecasted periods are as below:

	January (Rs '000)	February (Rs '000)	March (Rs '000)
Total sales	600	600	800

i. The trader sells directly to public against cash payments and to other entities on credit. Credit sales are expected to be four times the value of direct sales to public. He expects 15% customers to pay in the month in which credit sales are made, 25% to pay in the next month and 58% to pay in the next to next month. The outstanding balance is expected to be written off.

ii. Purchases of goods are made in the month prior to sales and it amounts to 90% of sales and are made on credit. Payments of these occur in the month after the purchase. No inventories of goods are held.

iii. Cash balance as on 1st January, 2021 is Rs 50,000.

iv. Actual sales for the last two months of calendar year 2020 are as below:

	November (Rs '000)	December (Rs '000)
Total sales	640	880

You are required to prepare a monthly cash, budget for the three months from January to March, 2021.

Solution 8

1. **Calculation of cash and credit sales** (Rs in thousands)

	Nov.	Dec.	Jan.	Feb.	Mar.
Total Sales	640	880	600	600	800
Cash Sales (1/5th of total sales)	128	176	120	120	160
Credit Sales (4/5th of total sales)	512	704	480	480	640

2. **Calculation of Credit Sales Receipts**

Month	Nov.	Dec.	Jan.	Feb.	Mar.
Forecast Credit sales (Working note 1)	512.00	704.00	480.00	480.00	640.00
Receipts:					
15% in the month of sales			**72.00**	**72.00**	**96.00**
25% in next month			**176.00**	**120.00**	**120.00**
58% in next to next month			**296.96**	**408.32**	**278.40**
Total			**544.96**	**600.32**	**494.40**

3. **Cash Budget** (Rs in thousands)

	Nov.	Dec.	Jan.	Feb.	Mar.
Opening Balance **(A)**			50.00	174.96	355.28
Sales	640.00	880.00	600.00	600.00	800.00
Receipts:					
Cash Collection (Working note 1)			120.00	120.00	160.00
Credit Collections (Working note 2)			544.96	600.32	494.40
Total **(B)**			664.96	720.32	654.40
Purchases (90% of sales in the month prior to sales)		540	540	720	
Payments:					
Payment for purchases (next month)			**540**	**540**	**720**
Total **(C)**			540	540	720
Closing balance**(D)** = **(A + B – C)**			174.96	355.28	**289.68**

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Financial Management

Chapter 9
Management of Working Capital

Unit 3- Management of Inventory

Important Questions

By CA Mohnish Vora (MVSIR)

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Question 9 **Unit 3 - EOQ Model**

ICAI SM

Pure air Company is a distributor of air filters to retail stores. It buys its filters from several manufacturers. Filters are ordered in lot sizes of 1,000 and each order costs Rs. 40 to place. Demand from retail stores is 20,000 filters per month, and carrying cost is Rs. 0.10 a filter per month.

a) COMPUTE the optimal order quantity with respect to so many lot sizes?

b) CALCULATE the optimal order quantity if the carrying cost were Rs. 0.05 a filter per month?

c) COMPUTE the optimal order quantity if ordering costs were Rs. 10?

Solution 9

a. $EOQ^* = \sqrt{\frac{2x20x40}{100}} = 4$

Carrying costs = Rs. 0.10 × 1,000 = Rs. 100. The optimal order size would be 4,000 filters, which represents five orders a month.

b. $EOQ^* = \sqrt{\frac{2x20x40}{50}} = 5.66$

Since the lot size is 1,000 filters, the company would order 6,000 filters each time. The lower the carrying cost, the more important ordering costs become relatively, and the larger the optimal order size.

c. $EOQ^* = \sqrt{\frac{2 \times 20 \times 10}{100}} = 2$

The lower the order cost, the more important carrying costs become relatively and the smaller the optimal order size.

Question 10 — **Unit 3 – Re-order level & EOQ**

PYQ May 22

A company requires 36,000 units of a product per year at cost of Rs. 100 per unit. Ordering cost per order is Rs. 250 and the carrying cost is 4.5% per year of the inventory cost. Normal lead time is 25 days and safety stock is NIL.

Assume 360 working days in a year.

i. Calculate the Reorder Inventory Level.

ii. Calculate the Economic Order Quantity (EOQ).

iii. If the supplier offers 1% quantity discount for purchase in lots of 9,000 units or more, should the company accept the proposal?

Solution 10

Annual Consumption = 36,000 (A)

Ordering Cost = Rs. 250 per order (O)

Carrying Cost = $\frac{4.5}{100} \times 100$ = Rs. 4.5 (C)

Lead Time = 25 days

i. Reorder Level = Lead Time × Daily Consumption ⇒ $\frac{36,000}{360} \times 25$ = Rs. 4.5 (C)

= 2,500 units

ii. Economic Order Quantity (EOQ) = $\sqrt{\frac{2AO}{C}}$ ⇒ $\sqrt{\frac{2 \times 36,000 \times 250}{4.5}}$ = 2,000 units

iii. Evaluation of Profitability of Quantity Discount Offer:

a. When EOQ is ordered

		(Rs.)
Purchase Cost	(36,000 units Rs. Rs. 100)	36,00,000
Ordering Cost	[(36,000 units/2,000 units) Rs. Rs. 250]	4,500
Carrying Cost	(2,000 units Rs. ½ Rs. Rs. 4.5)	4,500
Total Cost		36,09,000

b. When Quantity Discount is accepted

		(Rs.)
Purchase Cost	(36,000 units x Rs. 99*)	35,64,000
Ordering Cost	[(36,000 units/9,000 units) Rs. 250]	1,000
Carrying Cost	(9,000 units ½ Rs. 99 x 4.5%)	20,048
Total Cost	35,85,048	

*Unit Cost = Rs.100

Less: Quantity Discount @ 1% = Rs. 1

Purchase Cost = Rs. 99

Advise – The total cost of inventory is lower if Quantity Discount is accepted.

Hence, the company is advised to accept the proposal.

Notes :

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Chapter 9
Management of Working Capital

Unit 4- Management of Receivables

Important Questions

By CA Mohnish Vora (MVSIR)

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Question 11 — **Unit 4 – Evaluation of Credit Policies**

ICAI SM, RTP Nov 20

A company wants to follow a more prudent policy to improve its sales for the region which is Rs. 9 lakhs per annum at present, having an average collection period of 45 days. After certain researches, the management consultant of the company reveals the following information:

Credit Policy	Increase in collection period	Increase in sales	Present default anticipated
W	15 days	Rs. 60,000	1.5%
X	30 days	Rs. 90,000	2%
Y	45 days	Rs. 1,50,000	3%
Z	70 days	Rs. 2,10,000	4%

The selling price per unit is Rs. 3. Average cost per unit is Rs. 2.25 and variable costs per unit are Rs. 2. The current bad debt loss is 1%. Required return on additional investment is 20%. (Assume 360 days year)

ANALYSE which of the above policies would you recommend for adoption?

Solution 11

A. Statement showing the Evaluation of Debtors Policies (Total Approach)

(Rs. In 000)

Particulars		Present Policy 45days	Proposed Policy W 60 days	Proposed Policy X 75 days	Proposed Policy Y 90 days	Proposed Policy Z 115 days
I.	**Expected Profit:**					
	(a) Credit Sales	900	960	990	1050	1110
	(b) Total Cost other than Bad Debts					
	(i) Variable Costs [Sales × 2/3]	600	640	660	700	740
	(ii) Fixed Costs	75	75	75	75	75
		675	715	735	775	815
	(c) Bad Debts	9	14.40	19.80	31.50	44.40
	(d) Expected Profit [(a) – (b) – (c)]	216	230.60	235.20	243.50	250.60

II.	Opportunity Cost of Investments in Receivables	16.875	23.833	30.625	38.750	52.069
III	Net Benefits (I – II)	199.125	206.767	204.575	204.750	198.531

Recommendation: The Proposed Policy W (i.e. increase in collection period by 15 days or total 60 days) should be adopted since the net benefits under this policy are higher as compared to other policies.

Working Notes:

(i) Calculation of Fixed Cost = [Average Cost p.u. – Variable Cost p.u.] × No. of Units sold
= [2.25 - 2.00] × (9,00,000/3) = 0.25 × 3,00,000 = Rs 75,000

(ii) Calculation of Opportunity Cost of Average Investments Opportunity Cost
= Total Cost × [Collection period / 360] × [Rate of Return / 100]

- Present Policy = 6,75,000 × [45 / 360] x 20 / 100 = Rs 16,875
- Policy W = 7,15,000 × [60 / 360] × [20 / 100] = Rs 23,833
- Policy X = 7,35,000 × [75 / 360] × [20 / 100] = Rs 30,625
- Policy Y = 7,75,000 × [90 / 360] × [20 / 100] = Rs 38,750
- Policy Z = 8,15,000 × [115 / 360] × [20 / 100] = Rs 52,069

Note: The above question can be solved using 3 methods-

1) Total Approach – (use this in exam)

2) Incremental Approach – (follow this ONLY if question tells you)

3) Expected Rate of Return – (follow this ONLY if question tells you)

Another method of solving the problem is by computing Expected Rate of Return

$$\text{Expected Rate of Return} = \frac{\text{Incremental Expected Profit}}{\text{Incremental Investment in Receivables}} \times 100$$

For Policy W = $\frac{\text{Rs. 14,600}}{\text{Rs. 34,792}} \times 100 = 41.96\%$

For Policy X = $\frac{\text{Rs. 19,200}}{\text{Rs. 68,750}} \times 100 = 27.93\%$

For Policy Y = $\frac{\text{Rs. 27,500}}{\text{Rs. 1,09,375}} \times 100 = 25.14\%$

For Policy Z = $\frac{\text{Rs. 34,600}}{\text{Rs. 1,75,972}} \times 100 = 19.66\%$

Conclusion- The Proposed Policy W should be adopted since the Expected Rate of Return (41.96%) is more than the Required Rate of Return (20%) and is highest among the given policies compared.

Question 12 — **Unit 4 – Evaluation of Credit Policies**

ICAI SM, MTP Aug 18, Oct 20, MTP Nov 22, Oct 22

RST Limited is considering relaxing its present credit policy and is in the process of evaluating two proposed polices. Currently, the firm has annual credit sales of Rs 225 lakhs and accounts receivable turnover ratio of 5 times a year. The current level of loss due to bad debts is Rs.7,50,000.

The firm is required to give a return of 20% on the investment in new accounts receivables. The company's variable costs are 60% of the selling price. Given the following information, DETERMINE which is a better option?

(Amount in lakhs)

	Present Policy	Policy Option I	Policy Option II
Annual credit sales (Rs)	225	275	350
Accounts receivable turnover ratio	5	4	3
Bad debt losses (Rs)	7.5	22.5	47.5

Solution 12

Statement showing Evaluation of Credit Policies

	Particulars	Present Policy (Rs.)	Policy Option I (Rs.)	Policy Option II (Rs.)
A	Expected Profit :			
	(a) Credit Sales	225.00	275.00	350.00
	(b) Total Cost other than Bad Debts:			
	Variable Costs	135.00	165.00	210.00
	(c) Bad Debts	7.50	22.50	47.50
	(d) Expected Profit [(a)-(b)-(c)]	82.50	87.50	92.50
B	Opportunity Cost of Investment in Receivables*	5.40	8.25	14.00
C	Net Benefits [A-B]	77.10	79.25	78.50

Recommendation: The Proposed Policy I should be adopted since the net benefits under this policy is higher than those under other policies.

Working Note:

*Calculation of Opportunity Cost of Average Investments

$$\text{Opportunity Cost} = \text{Total Cost} \times \frac{\text{Collection Period}}{12} \times \text{Return on Investment}$$

Present Policy = Rs.135 lakhs × 2.4/12 × 20% = Rs. 5.40 lakhs

Proposed Policy I = Rs. 165 lakhs × 3/12 × 20% = Rs. 8.25 lakhs

Proposed Policy II = Rs. 210 lakhs × 4/12 × 20% = Rs. 14.00 lakhs

Question 13 — Unit 4 - Management Of Receivables - Factoring

ICAI SM

A Factoring firm has credit sales of Rs. 360 lakhs and its average collection period is 30 days. The financial controller estimates, bad debt losses are around 2% of credit sales. The firm spends Rs. 1,40,000 annually on debtors administration. This cost comprises of telephonic and fax bills along with salaries of staff members. These are the avoidable costs. A Factoring firm has offered to buy the firm's receivables. The factor will charge 1% commission and will pay an advance against receivables on an interest @15% p.a. after withholding 10% as reserve. ANALYSE what should the firm do? Assume 360 days in a year.

Solution 13

Working notes:

Average level of receivables = Rs. 360 lakhs × 30/360 = 30 Lakhs

Factoring Commission = 1% of Rs. 30,00,000	Rs. 30,000
Reserve = 10% of Rs. 30,00,000	Rs. 3,00,000
Total (i)	Rs. 3,30,000
Thus, the amount available for advance is	
Average level of receivables	Rs. 30,00,000
Less: Total (i) from above	Rs. 3,30,000
(ii)	Rs. 26,70,000
Less: Interest @ 15% p.a. for 30 days	Rs. 33,375
Net Amount of Advance available	Rs. 26,36,625

Evaluation of Factoring Proposal

	Particulars	Rs.	Rs.
A.	Savings (Benefit) to the firm		
	Cost of Credit administration	Rs. 1,40,000	Rs. 1,40,000
	Cost of bad-debt losses	(0.02 × 360 lakhs)	Rs. 7,20,000
	Total		Rs. 8,60,000
B.	Cost to the Firm:		
	Factoring Commission [Annual credit Sales × % of Commission (or calculated annually)]	30,000 x 360/30	Rs. 3,60,000
	Interest Charges	Rs. 33,375× 360/30	Rs. 4,00,500
	Total		Rs. 7,60,500
C.	Net Benefits to the Firm: (A-B)		Rs. 99,500

Advice: Since the savings to the firm exceeds the cost to the firm on account of factoring, therefore, the proposal is acceptable.

Question 14 **Unit 4 - Factoring**

MTP Mar 19

Navya Ltd has annual credit sales of Rs. 45 lakhs. Credit terms are 30 days, but its management of receivables has been poor and the average collection period is 50 days, Bad debt is 0.4 per cent of sales. A factor has offered to take over the task of debt administration and credit checking, at an annual fee of 1 per cent of credit sales. Navya Ltd. estimates that it would save Rs. 35,000 per year in administration costs as a result. Due to the efficiency of the factor, the average collection period would reduce to 30 days and bad debts would be zero. The factor would advance 80 per cent of invoiced debts at an annual interest rate of 11 per cent. Navya Ltd. is currently financing receivables from an overdraft costing 10 per cent per year.

If occurrence of credit sales is throughout the year, COMPUTE whether the factor's services should be accepted or rejected. Assume 365 days in a year.

Solution 14

	Rs.
Present level of receivables is	6,16,438
In case of factor, receivables would reduce to	3,69,863
The costs of the existing policy are as follows:	
Cost of financing existing receivables:	61,644
Cost of bad debts:	18,000
Cost of current policy	79,644

The cost under the factor are as follows:	
Cost of financing new receivable through factor:	
(Rs. 3,69,863 × 0.8 × 0.11) + (Rs. 3,69,863 × 0.2 × 0.10) = (32,548 + 7,397)	39,945
Factor's annual fee:	45,000
Administration costs saved:	(35,000)
Net cost under factor:	49,945

From the above analysis it is clear that the factor's services are cheaper than Existing policy by Rs. 29,699 (Rs. 79,644 - Rs.49,945) per year. Hence, the services of the factor should be accepted.

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Unit 5- Management of Payables

Important Questions

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Question 15 — **Unit 5 – Cost of not taking discount**

ICAI SM

The Dolce Company purchases raw materials on terms of 2/10, net 30. A review of the company's records by the owner, Mr. Gautam, revealed that payments are usually made 15 days after purchases are made. When asked why the firm did not take advantage of its discounts, the accountant, Mr. Rohit, replied that it cost only 2 per cent for these funds, whereas a bank loan would cost the company 12 per cent.

a) ANALYSE what mistake is Rohit making?

b) If the firm could not borrow from the bank and was forced to resort to the use of trade credit funds, what suggestion might be made to Rohit that would reduce the annual interest cost? IDENTIFY.

Solution 15

a) Rohit's argument of comparing 2% discount with 12% bank loan rate is not rational as 2% discount can be earned by making payment 5 days in advance i.e. within 10 days rather 15 days as payments are made presently. Whereas 12% bank loan rate is for a year.

Assume that the purchase value is Rs. 100, the discount can be earned by making payment within 10 days is Rs. 2, therefore, net payment would be Rs. 98 only. Annualized benefit

$$= \frac{\text{Rs. } 2}{\text{Rs. } 98} \times \frac{365 \text{ days}}{5 \text{ days}} \times 100 = 149\%$$

This means cost of not taking cash discount is 149%

b) If the bank loan facility could not be available, then in this case the company should resort to utilise maximum credit period as possible.

Therefore, payment should be made in 30 days to reduce the interest cost.

Question 16 — **Unit 5 – Cost of not taking Discount**

RTP May 18

A Ltd. is in manufacturing business & it acquires raw material from X Ltd. on a regular basis. As per the terms of agreement the payment must be made within 40 days of purchase. However, A Ltd. has a choice of paying Rs. 98.50 per Rs. 100 it owes to X Ltd. On or before 10th day of purchase.

Required: EXAMINE whether A Ltd. should accept the offer of discount assuming average billing of A Ltd. with X Ltd. is Rs. 10,00,000 and an alternative investment yield a return of 15% and company pays the invoice.

Solution 16

Annual Benefit of accepting the Discount

$$\frac{\text{Rs. 1.5}}{\text{Rs. 100 – Rs. 1.50}} \times \frac{\text{365 days}}{\text{40 – 10 days}} = 18.53\%$$

Annual Cost = Opportunity Cost of foregoing interest on investment = 15%

If average invoice amount is Rs. 10,00,000

	If discount is	
	Accepted (Rs.)	Not Accepted (Rs.)
Payment to Supplier (Rs.)	9,85000	10,00,000
ROI of Rs.9,85,000 for 30 days {Rs. 9,85,000 × (30/365) × 15%}		(12,144)
	9,85,000	9,87,856

Thus, from above table it can be seen that it is cheaper to accept the discount.

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Chapter 9
Management of Working Capital

Unit 6- Financing of Working Capital

Important Questions

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Question 17 **Unit 6 - Sources of Working Capital Funds**

RTP Nov 21, PYQ Dec 21, MTP April 23

The Alliance Ltd., a Petrochemical sector company had just invested huge amount in its new expansion project. Due to huge capital investment, the company is in need of an additional Rs. 1,50,000 in working capital immediately. The Finance Manger has determined the following three feasible sources of working capital funds

i. Bank loan: The Company's bank will lend Rs. 2,00,000 at 15%. A 10% compensating balance will be required, which otherwise would not be maintained by the company.

ii. Trade credit: The company has been offered credit terms from its major supplier of 3/30, net 90 for purchasing raw materials worth Rs. 1,00,000 per month.

iii. Factoring: A factoring firm will buy the company's receivables of Rs. 2,00,000 per month, which have a collection period of 60 days. The factor will advance up to 75% of the face value of the receivables at 12% on an annual basis. The factor will also charge commission of 2% on all receivables purchased. It has been estimated that the factor's services will save the company a credit department expense and bad debt expense of Rs. 1,250 and Rs. 1,750 per month respectively.

On the basis of annual percentage cost, ADVISE which alternative should the company select? Assume 360 days year.

Solution 17

i. Bank loan: Since the compensating balance would not otherwise be maintained, the real annual cost of taking bank loan would be:

$$\frac{15}{90} \times 100 = 16.67\% \text{ p.a.}$$

ii. Trade credit: Amount upto Rs. 1,50,000 can be raised within 2 months or 60 days. The real annual cost of trade credit would be:

$$\frac{3}{97} \times \frac{360}{60} \times 100 = 18.56\% \text{ p.a.}$$

iii. Factoring:

Commission charges per year = 2% x (Rs. 2,00,000 x 12) = Rs. 48,000

Total Savings per year = (Rs. 1,250 + Rs. 1,750) x 12 = Rs. 36,000

Net factoring cost per year = Rs. 48,000 - Rs. 36,000 = Rs. 12,000

Annual Cost of Borrowing Rs. 1,50,000 receivables through factoring would be:

$$\frac{12\% \times 1,50,000 + 12,000}{\text{Rs. } 1,50,000} \times 100 = \frac{\text{Rs.}18,000 + \text{Rs.}12,000}{\text{Rs. } 1,50,000} \times 100 = 20\% \text{ p.a.}$$

Advise: The company should select alternative of Bank Loan as it has the lowest annual cost i.e. 16.67% p.a.

Question 18 — Unit 6 - Maximum Permissible Bank Finance

PYQ May 22

Following information and ratios are given for W Limited for the year ended 31st March, 2022

Liabilities	Amount	Assets	Amount
Equity Shares Rs. 10 each	200	Fixed Assets	500
Retained earnings	200	Raw materials	150
11% Debentures	300	W.I.P	100
Public deposits (Short-Term)	100	Finished goods	50
Trade Creditors	80	Debtors	125
Bills Payable	100	Cash/Bank	55
	980		**980**

Calculate the amount of maximum permissible bank finance under three methods as per Tandon Committee lending norms.

The total core current assets are assumed to be Rs. 30 lakhs.

Solution 18

Current Assets = 150 + 100 + 50 + 125 + 55 = Rs. 480 Lakhs

Current Liabilities = 100 + 80 + 100 = Rs. 280 Lakhs

Maximum Permissible Banks Finance under Tandon Committee Norms:

Method I

Maximum Permissible Bank Finance = 75% of (Current Assets – Current Liabilities)

= 75% of (480 - 280) = Rs. 150 Lakhs

Method II

Maximum Permissible Bank Finance = 75% of Current Assets – Current Liabilities

= 75 % of 480 – 280 = Rs. 80 Lakhs

Method III

Maximum Permissible Bank Finance = 75% of (Current Assets – Core Current Assets) – Current Liabilities

= 75 % of (480 - 30) – 280 = Rs. 57.5 Lakhs

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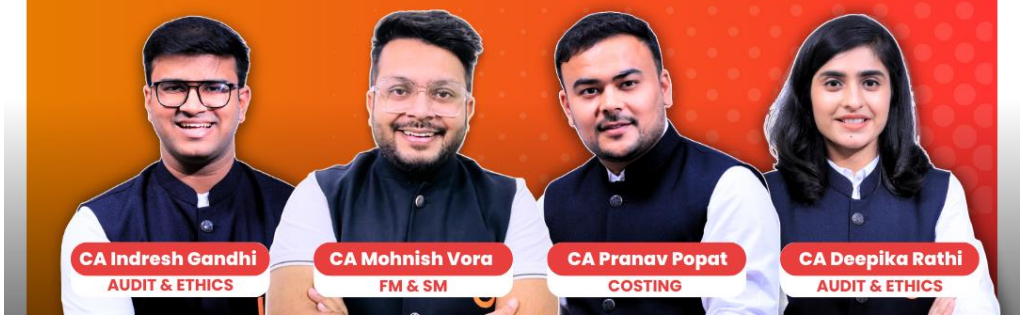

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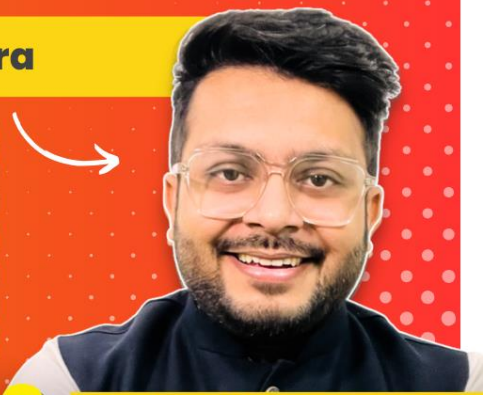

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