Q.2.

(a) **Calculation of current variable cost**

	Rs.	
Sales	25,000,000	
less: variable cost	12,500,000	(balancing)
Contribution margin	12,500,000	
less: fixed cost	10,000,000	
Net profit	2,500,000	

Variable cost per unit 250,000

Calculation of profit if change is made

	Rs.	
Sales	33,250,000	(70 x 475,000)
less: variable cost	14,000,000	(70 x 200,000)
Contribution margin	19,250,000	
less: fixed cost	12,500,000	(10,000,000 + 2,500,000)
Net profit	6,750,000	

Calculation of incremental profit

	Rs.
Revised profit	6,750,000
Original profit	2,500,000
Incremental profit	4,250,000

Calculation of return on investment

$$ROI = \frac{\text{Profit}}{\text{Investment}} = \frac{4,250,000}{20,000,000} = 21.25\%$$

Since the ROI exceeds the 15 percent cost of capital, this analysis suggests that the firm should go ahead with the change.

Q.2

(b) **Operating leverage**

	Existing	Proposed
	Rs.	Rs.
Variable cost	12,500,000	14,000,000
Fixed cost	10,000,000	12,500,000
Total cost	22,500,000	26,500,000
Operating leverage	44.44%	47.17%

Result: The change would increase the operating leverage.

Break-even point

	Existing	Proposed
	Rs.	Rs.
Fixed cost	10,000,000	12,500,000
Contribution margin per unit	250,000	275,000
Break even point (units)	40.00	45.45

Result: The change would increase the break even point.

(c) It is impossible to state unequivocally whether the new situation would have more or less business risk than the old one. We would need information on both the sales probability distribution and the uncertainty about variable input cost in order to make this determination. However, since a higher breakeven point, other things held constant, is more risky, the change in breakeven points and also the higher percentage of fixed costs suggests that the new situation is more risky.

Q.3. *figures in thousands*

a)

(i) Present value of Rs. 138 million receivable to be paid at the end of year one:

$$PV = \frac{\text{Rs. 138 million}}{1.15} = \text{Rs. 120 million}$$

Expected present value of the receivable allowing for the bad debts:

EPV = Rs. 120 million x 0.8 = Rs. 96 million

Cost of the order to Quality Sports Co.

C = Rs. 138 million x 0.696 = Rs. 96 million

As cost approximately equal the expected present value, Quality Sports should be indifferent as to whether or not the order is accepted.

(ii) If costs were 74% of the selling price:

C = Rs. 138 million x 0.74 = Rs. 102 million

As cost exceeds the expected present value of sale, the order should be rejected.

If costs were 65% of the selling price:

C = Rs. 138 million x 0.65 = Rs. 90 million

Here the order should be accepted.

Q.3.

b) *figures in thousands*

	Current	A	B	C
	Rs.	Rs.	Rs.	Rs.
Sales	2,250.00	2,500.00	2,700.00	2,825.00
Variable cost	1,575.00	1,750.00	1,890.00	1,977.50
Contribution margin	675.00	750.00	810.00	847.50
Fixed cost	50.00	50.00	50.00	50.00
EBIT	625.00	700.00	760.00	797.50
Inventory turnover (times)	10	8	6	4
Inventory value	157.50	218.75	315.00	494.38
EBIT	625.00	700.00	760.00	797.50
Carrying cost - 5%	7.88	10.94	15.75	24.72
Net profit before tax	617.13	689.06	744.25	772.78
Taxation - 35%	215.99	241.17	260.49	270.47
	401.13	447.89	483.76	502.31
Incremental profit		46.76	82.63	101.18
Incremental investment (inventory)		61.25	157.50	336.88
Return on incremental investment		76.3%	52.5%	30.0%

Recommendation

The return on incremental investment is highest in policy A.

Q.3.

c)

(i) Size of bank loan = $\frac{\text{Purchases}}{\text{Day}} \times \text{Days late}$

= $\frac{\text{Purchases}}{\text{Days payables outstanding}} \times (\text{Days outstanding} - 30)$

= $\frac{3,000}{60} \times (60 - 30)$

= 50 x 30

= Rs. 1,500,000

Alternatively, one could simply recognize that accounts payable must be cut to half of its existing level, because 30 days is half of 60 days.

(ii) If I were the bank loan officer, I would have denied the loan based on following analysis:

1) Debt ratio = $\frac{7,500 + 3500}{15,000}$ = 73%

Rehbar's debt ratio is 73%, as compared to a typical debt ratio of 50%. The firm appears to be undercapitaliz

2) Current ratio = $\frac{9,000}{7,500}$ = 1.2

The current ratio appears to be low, but current assets could cover current liabilities if all accounts receivable can be collected and if the inventory can be liquidated at its book value.

3) Quick ratio = $\frac{9,000 - 7000}{7,500}$ = 0.27

The quick ratio indicates that current assets, excluding inventory, are only sufficient to cover 27% of current liabilities, which is very bad.

The company appears to be carrying excess inventory and financing extensively with debt. Bank borrowings are already high, and the liquidity situation is poor. On the basis of these observations, the loan should be denied, and the treasurer should be advised to seek permanent capital, especially equity capital.

Q.4. *figures in thousands*

a)

(i) Net cost of machine:

	Rs.
Cash price	1,820,000
Cost of modification	187,500
Increase in working capital	82,500
Total cash flow for new machine	2,090,000

(ii) Net operating cash flow

	Year 1	Year 2	Year 3	Year 4
Saving from machine	660,000	660,000	660,000	660,000
Tax on operating profit - 35%	(231,000)	(231,000)	(231,000)	(231,000)
Tax saving on depreciation	70,263	63,236	56,913	51,221
	499,263	492,236	485,913	480,221

	Depreciable cost		Allowance		Depreciation expense		Tax rate		Tax saving
Year 1	2,007,500	x	10%	=	200,750	x	35%	=	70,263
Year 2	1,806,750	x	10%	=	180,675	x	35%	=	63,236
Year 3	1,626,075	x	10%	=	162,608	x	35%	=	56,913
Year 4	1,463,468	x	10%	=	146,347	x	35%	=	51,221

(iii) The cash flow for the terminal year will be Rs. 1,453,492

	Rs.
Sale proceeds	1,400,000
Tax on gain on disposal	(29,008)
Release of working capital	82,500
	1,453,492

Computation of tax gain

	Rs.	
Sale proceeds	1,400,000	
Tax WDV	1,317,121	
Tax gain	82,879	
Tax on gain on disposal	35%	(29,008)

(iv) **Calculation of Net Present Value**

Years	Cash flow	PV factor @ 12%	Present value
0	(2,090,000)	1.0000	(2,090,000)
1	499,263	0.8929	445,771
2	492,236	0.7972	392,408
3	485,913	0.7118	345,863
4	1,933,713	0.6355	1,228,910
Net Present Value			322,951

Decision: The project has positive NPV, therefore, it may be accepted.

Q.4.

b)

		Rs.	
(i)	Investment	2,250,000	

Computation of cash flows

Sales revenue	2,070,000	(1,000 x 2,070)
Variable cost	1,575,000	(1,000 x 1,575)
Contribution	495,000	
Tax 35%	173,250	
Cash flow after tax	321,750	
Present value of Cash flows	2,145,000	
less: Investment outlay	2,250,000	
Net present value	(105,000)	

The project should not be accepted as the NPV is negative.

(ii) Real cost of capital can be calculated as follows:

$(1 + k_n) = (1 + i) \times (1 + k_r)$

where k_n = nominal rate of return
k_r = real rate of return
i = inflation rate

$1.15 = 1.06 \times (1 + k_r)$
$(1 + k_r) = 1.08$
$k_r = 8.49\%$

	Rs.
Net cash flow before inflation	321,750
Present value	3,789,500
Investment outlay	2,250,000
Net present value	1,539,500

After adjusting for expected inflation, we see that the project has a positive NPV and should be accepted. Inflation is already reflected in the denominator (the cost of capital), so it must also be reflected in the numerator.

(iii) If part of the costs were fixed, and hence did not rise with inflation, then sales revenues would rise faster than total costs. However, when the plant wears out and must be re-placed, inflation will cause the replacement cost to jump, necessitating a sharp output price increase to cover the now higher depreciation charges.

Note:
The current variable cost per unit is higher than the sales price, therefore, ordinarily the NPV will be negative whether or not inflation is considered.

Q.5.

a)

i) **Gain made by ordinary shareholders**

	Rs.
Cash flow from the project	2,100,000
less: financial charges	1,500,000
Increase in dividend	600,000
Original dividend	2,400,000
New dividend to ordinary shareholders	3,000,000
Cost of equity	22%
	Rs.
Value of shares	13,636,364
Original value of shares	12,000,000
Gain to ordinary shareholders	1,636,364

ii) Weighted Average Cost of Capital (WACC)

	Market value	Proportion	Cost	WACC
	Rs.	%	%	%
Equity	13,636,364	57.7%	22%	12.69%
Debt	10,000,000	42.3%	15%	6.35%
	23,636,364	100.00%		19.04%

b) i) **Gain made by ordinary shareholders**

	Rs.	
Value of shares	12,500,000	(3,000,000 / 24%)
Original value of shares	12,000,000	
Gain to ordinary shareholders	500,000	

ii) **Calculation of WACC**

	Market value	Proportion	Cost	WACC
	Rs.	%	%	%
Equity	12,500,000	55.6%	24%	13.33%
Debt	10,000,000	44.4%	15%	6.67%
	22,500,000	100.00%		20.00%

iii) **Calculation of Net Present Value**

	Rs.
Annual cash flow from project	2,100,000
WACC	20%
Present value of cash flows	10,500,000
less: Investment outlay	(10,000,000)
Net Present Value	500,000

The net present value of the project discounted at the weighted average cost of capital shows the gain made by ordinary shareholders subject to condition that MM hypothesis, i.e. WACC is unchanged by change in gearing, holds true.

Q.6.

a)

Current EPS - Rs. 4

Years	EPS	Pay-out ratio	Dividend per share	Discount rate 14%	Present Value Rs.
1	4.80	25%	1.20	0.88	1.05
2	5.76	25%	1.44	0.77	1.11
3	6.91	25%	1.73	0.67	1.17
4	8.29	25%	2.07	0.59	1.23
5	9.28	40%	3.71	0.52	1.93
6	10.39	40%	4.16	0.46	1.90
7	11.64	40%	4.66	0.40	1.86
8	13.04	40%	5.22	0.35	1.83
9	13.82				
			24.19		12.07
Present value at 14% discount rate of dividends from year 1-8					12.07
Price at the end of year 8	13.82	x 8.50	= 117.47	0.35	41.18
					53.25

b) *figures in thousands*

(i)

Year	Net Income	Capital expend.	Dividends		Level of financing required
			Per share	Total	
1	50,000	25,000	@ Rs.2.50	25,000	0
2	37,500	37,500	-	0	0
3	62,500	50,000	@ Rs.1.25	12,500	0
4	57,500	37,500	@ Rs.2.00	20,000	0
5	45,000	50,000		0	5,000

If dividends are treated as a residual decision, the financing required will be Rs. 5 million in year 5.

(ii) If present dividends of Rs. 2.5 per share is maintained the level of financing required per year will be:

Year	Net Income	Capital expend.	Dividends	Level of financing
1	50,000	25,000	25,000	0
2	37,500	37,500	25,000	25,000
3	62,500	50,000	25,000	12,500
4	57,500	37,500	25,000	5,000
5	45,000	50,000	25,000	30,000

(iii) If a dividend payout of 50% is maintained, the dividends and financing required will be as follows:

Year	Net Income	Capital expend.	Dividends per share		Level of financing required
			Rs.	Total	
1	50,000	25,000	2.50	25,000	0
2	37,500	37,500	1.875	18,750	18,750
3	62,500	50,000	3.125	31,250	18,750
4	57,500	37,500	2.875	28,750	8,750
5	45,000	50,000	2.25	22,500	27,500

(iv)

Aggregate dividends are maximized in case of 50% payout dividend policy
External financing is minimized in case of residual dividend policy