Business Finance Decisions
Suggested Answers
Final Examinations – Summer 2010

A.1 (a)

	YEARS				
	1	2	3	4	5
	----------Rupees in million----------				
Existing operating profit from current projects [67.79(W-1)x1.12]	75.92	85.03	95.23	106.66	119.46
Operating profit from new investment plan (W-2)	-	5.85	13.05	22.95	32.85
Less: Depreciation for the year (W-3)	(15.12)	(18.70)	(23.10)	(29.53)	(35.00)
Less: Interest on debt (W-5)	(12.58)	(13.05)	(14.10)	(15.73)	(16.92)
Net profit before tax	48.22	59.13	71.08	84.35	100.39
Tax (38%, 36%, 34%, 34%, 34%)	(18.32)	(21.29)	(24.16)	(28.68)	(34.13)
Net profit after tax	29.90	37.84	46.91	55.67	66.26
Less: Retained for CAPEX (A × 60%)	(23.40)	(28.80)	(39.60)	(39.60)	*(48.60)
Residual income for dividend distribution	**6.50**	**9.04**	**7.31**	**16.07**	**17.66**

*(Rs. 300 m x 27% x 60%)

(b) The company would have surplus cash of Rs. 79.55 million (W-5) which is less than Rs. 90 million. However, the company may pay the amount by obtaining the balance amount from its short term running finance facility.

WORKINGS

W-1: Existing operating profit

	Rs. in millions
Net profit before tax and interest (190 - 110 - 30)	50.00
Add: Depreciation for current year (100.8 × 15 ÷ 85)	17.79
Operating profit	67.79

W-2: Operating profit from new projects

		YEARS				
		1	2	3	4	5
Year wise outlay for CAPEX in percentage terms		0%	13%	16%	22%	22%
		----------Rs. in million----------				
Year wise planned CAPEX (Rs. 300m × CAPEX %)	**A**	-	39.00	48.00	66.00	66.00
Cumulative new CAPEX	**B**	-	39.00	87.00	153.00	219.00
Yield from new projects : **(B)** × 15% pre-tax cash flow		**-**	**5.85**	**13.05**	**22.95**	**32.85**
W-3: Depreciation for the year						
WDV at the beginning of year		100.80	85.68	105.98	130.88	167.35
Addition during the year (A**)**		-	39.00	48.00	66.00	66.00
Depreciable value		100.80	124.68	153.98	196.88	233.35
Depreciation for the year		**15.12**	**18.70**	**23.10**	**29.53**	**35.00**
WDV at the end of year		85.68	105.98	130.88	167.35	198.35
W-4: Interest on debts						
Long term debt at the beginning of year (Rs.135m÷60×40)		90.00	90.00	105.60	124.80	151.20
New debt during the year (A × 40%)		-	15.60	19.20	26.40	26.40
Long Term debt at the end of year		90.00	105.60	124.80	151.20	177.6
Interest on long term debt (15- (20 x 0.16)) ÷ 90= 13.11%		11.80	13.84	16.36	19.82	23.28
Interest on short term debt **(W-5)**		0.78	-	-	-	-
Interest income **(W-5)**		-	(0.79)	(2.26)	(4.09)	(6.36)
		12.58	13.05	14.10	15.73	16.92

(W-5) Interest on short term running finance

Opening outstanding balance / (Cash)		20.00	4.88	(9.92)	(28.22)	(51.15)
Additional working capital (10% of additional CAPEX)		-	3.90	4.80	6.60	6.60
Less: Additional cash flow generated (Depreciation)		(15.12)	(18.70)	(23.10)	(29.53)	(35.00)
Debt / (balance) at the end of year		4.88	(9.92)	(28.22)	(51.15)	(79.55)
Interest on short term running finance		0.78	-	-	-	-
Interest income		-	(0.79)	(2.26)	(4.09)	(6.36)

A.2 (a) **VALUE OF MK LIMITED**

		Years	
		1	**2**
		Rupees in million	
Sales	4%	12,480	12,979
Operating costs including depreciation	75%	(9,360)	(9,734)
Profit before interest and tax		3,120	3,245
Taxation	35%	(1,092)	(1,136)
Add back depreciation	4%	1,357	1,411
Annual capital expenditure	4%	(728)	(757)
Free cash flow		**2,657**	**2,763**
Discount factor **(W1)**	9.8%	0.911	0.830
Present value		2,421	2,292

Present value 1 - 2 years 4,713

Free cash flow after year 2 = $\frac{2{,}763(1.05)}{0.098 - 0.05}$ x 0.83 = Rs. 50,166 million

Total free cash flows = (4,713 + 50,166) Rs. 54,879 million

W1: Weighted Average Cost of Capital

	D/E Ratio	**Rate**	**WACC**
k_e (8% + (13% -8%) x 1.1)	60%	13.50%	8.1%
k_d (6.5% x 0.65)	40%	4.23%	1.7%
WACC			9.8%

VALUE OF ZA LIMITED

		Years	
		1	**2**
		Rupees in million	
Sales	**5.5%**	8,925	9,416
Operating costs including depreciation	5.5%	(6,219)	(6,561)
Profit before interest and tax		2,706	2,855
Taxation	35%	(947)	(999)
Add back depreciation	5.5%	1,044	1,101
Annual capital expenditure	5.5%	(686)	(724)
Free cash flow		**2,117**	**2,233**
Discount factor **(W2)**	9.2%	0.916	0.839
Present value		1,939	1,873

Present value 1 - 2 years 3,812

Free cash flow after year 2 = $\frac{2{,}233(1.05)}{0.092 - 0.05}$ x 0.839 = Rs. 46,837 million

Total free cash flows = (3,812 + 46,837) Rs. 50,649 million

W2: Weighted Average Cost of Capital

	Rate	D/E %	WACC
k_e - (8% + (13% - 8%) x 1.3	14.5%	45%	6.5%
k_d - (7.5% x 65%)	4.9%	55%	2.7%
WACC			9.2%

VALUE OF PROPOSED MERGED COMPANY

		Years	
		1	2
		Rupees in million	
Combined Sales	5%	21,483	22,557
Operating costs including depreciation	70%	(15,038)	(15,790)
Profit before interest and tax		6,445	6,767
Taxation	35%	(2,256)	(2,368)
Add back depreciation	5%	2,410	2,531
Annual capital expenditure	5%	(1,418)	(1,489)
Free cash flow		**5,181**	**5,441**
Discount factor **(W3)**	9.8%	0.911	0.830
Present value		4,720	4,516

Present value 1 - 2 years 9,234

Free cash flow after year 2 = $\frac{5{,}441(1.055)}{0.098 - 0.055}$ x 0.83 = Rs. 110,800 million

Total free cash flows = (9,234 + 110,800) Rs. 120,036 million

W3: Weighted Average Cost of Capital

Equity - MK (100 x 20)	2,000	13.50%	270.00
Equity - ZA (90 x 7/9 x 20)	1,400	14.5%	203.00
Debt - MK (2,000 x 40% / 60%)	1,333	4.23%	56.00
Debt - ZA (90 x 12 x 55% / 45%)	1,320	4.98%	65.00
Total equity + debt of merged company	6,053		594

WACC = 594 ÷ 6,053 9.8%

(b) **Synergy effect of acquisition**

	Rupees in million
Total free cash flow of Merged Co.	120,036
Total free cash flow of MK Limited	54,879
Total free cash flow of ZA Limited	50,649
	105,528
Synergy effect of acquisition	**14,508**

A.3 (a) APV separates project value into one component associated with the unlevered operating cash flows and another associated with financing the project. Each component is evaluated separately.

The disaggregation of cash flows is undertaken so that different discount rates may be used. As operating cash flows are more risky, they are discounted at higher rate.

Comparative advantages of APV over WACC

(i) Unbundles major components of value – drivers of value are much more apparent under APV

than WACC.

(ii) Miscalculation in WACC, sometimes, produces large errors in the estimates of value. APV is less prone to such miscalculations.

(iii) Show better result when there are significant changes in capital structure.

(b) **Adjusted present value** **Rs in million**

Net present value on the basis of revised K_{eu}

	Years	Cash flows (Rs. in million)	Discount (W-1)	Present value (Rs. in million)
Investments	0	(600.00)	1.00	(600)
After tax cash flows **(180 x 0.65)**	1-8	117.00	*1 4.0775	477
Residual value	8	90.00	0.266	24
Net present value on the basis of revised K_{eu}				**(99)**
Tax shield [(600 x 55% x 9% x 35% x *2 6.21]				65
Issue costs - Right shares (3% x 600 x 45%)				(5)
- Loan (1% x 600 x 55%)				(2)
				(41)

*1 $\frac{1-(1+0.18)^{-8}}{0.18(W-1)} = 4.0775$ | *2 $\frac{1-(1+0.06)^{-8}}{0.06} = 6.21$

Conclusion

The project is not feasible for the company as the APV of the project is negative.

W-1: Cost of equity

$K_{eu} = R_f + (R_m - R_f) \times \beta_a$

$K_{eu} = 6\% + (14\% - 6\%) \times 1.5$

$= 18\%$

A.4 (a)

	Years					
	0	**1**	**2**	**3**	**4**	**5**
	----------Rupees in million----------					
Principal repayment		5.00	5.00	5.00	5.00	-
Interest (Principal outstanding x 16%)		3.20	2.40	1.60	0.80	-
Tax savings **(W-1)**		-	(3.40)	(1.31)	(0.99)	(3.41)
Recovery of residual value (Note)		-	-	-	(2.00)	-
Net cash outflow to DS		8.20	4.00	5.29	2.81	(3.41)
Discount @ 18%	1.00	0.85	0.72	0.61	0.52	0.44
PV of net cash outflow		6.97	2.88	3.23	1.46	(1.50)
Total PV of net cash outflow						13.04
NPV factor of tax rental income **(W-2)**						2.236
Annual rental						5.83

W-1: Tax savings

	Years					
	0	1	2	3	4	5
	----------Rupees in million----------					
WDV at start of year		20.00	13.50	12.15	10.93	
Initial depreciation (25%)		5.00	-	-	-	
Normal depreciation (10%)		1.50	1.35	1.22	1.09	
Loss on disposal **(Note)**		-	-	-	7.84	
Total tax allowance		6.50	1.35	1.22	8.93	
WDV at end of year		13.50	12.15	10.93	2.00	

Note: Disposal value i.e. Rs. 2 million (10% of Rs. 20 million) - WDV at the end of year 4 i.e. 9.84 = Rs. 7.84 million (Loss on disposal)

	Years					
	0	1	2	3	4	5
	----------Rupees in million----------					
Total tax allowance as computed above		6.50	1.35	1.22	8.93	
Interest payment computed above		3.20	2.40	1.60	0.80	
		9.70	3.75	2.82	9.73	
Tax savings @ 35% in next year			3.40	1.31	0.99	3.41

W-2 : NPV factor of after tax rental income

	Years					
	0	1	2	3	4	5
	----------Rupees ----------					
Income	1.00	1.00	1.00	1.00		
Tax savings		(0.35)	(0.35)	(0.35)	(0.35)	
	1.00	0.65	0.65	0.65	(0.35)	
Discount factor @ 18%	1.000	0.850	0.720	0.610	0.520	
PV factor of income	1.000	0.553	0.468	0.397	(0.182)	
Total PV of income	2.236					

(b) **Leasing**

	Years					
	0	1	2	3	4	5
	----- Rupees in million -----					
Annual rental	7.00	7.00	7.00	7.00		
Tax savings (rental x 35%)		(2.45)	(2.45)	(2.45)	(2.45)	
	7.00	4.55	4.55	4.55	(2.45)	
Discount at 20%	1	0.833	0.694	0.578	0.482	
PV of cash flow	7.00	3.79	3.16	2.63	(1.18)	15.4
NPV of leasing option	15.40					

Purchase Outright

		Years					
		0	1	2	3	4	5
		---------- Rupees in million ----------					
Principal outstanding (Opening - Loan payment + Interest)		20.00	16.17	11.65	6.30	0.00	
Loan payment **(W-1)**	**A**		7.43	7.43	7.43	7.43	
Interest (@18% of opening principal)			3.60	2.91	2.08	1.13	
Maintenance costs	**B**		0.60	0.60	0.60	0.60	
Tax allowance as computed above			6.50	1.35	1.22	8.93	-
			10.70	4.86	3.90	10.66	

Tax savings (in next year)	**C**		-	(3.75)	(1.70)	(1.37)	(3.73)
Recovery of residual value			-	-	-	(2.00)	-
Cash outflow to BP	**A + B + C**	-	8.03	4.29	6.33	4.67	(3.73)
Discount at 20%		-	0.833	0.694	0.578	0.482	0.402
PV of cash outflow		-	6.69	2.97	3.66	2.25	(1.50)
NPV of purchase option		14.07					

W-1:

$$\text{Installment amount} = \frac{\text{Rs. 20 million}}{\frac{1-(1+0.18)^{-4}}{0.18}} = 7.43$$

Conclusion:
The feasible option is the outright purchase.

Note: *Insurance costs are ignored in our computation as these are the same in both options.*

A.5 (a) (i) ▪ **Theoretical ex-right price**

	Rupees
Value of 5 original shares @ Rs. 16	80.00
Value of 2 right share @ Rs. 12.5)	25.00
	105.00
Ex-right price (Rs. 105 ÷ 7)	15.00

▪ **Value of the right**

Ex-right share price	15.00
Cost of acquiring right share	12.50
	2.50
Value of right per original share (Rs. 2.5 ÷ 5 share)	0.500

(ii) **Theoretical ex-right price**

	Rupees in million
Current shares market value (20 million share of Rs. 16 each)	320
Value of right shares (8 million shares of Rs. 12.5 each)	100
NPV	96
	516
Theoretical ex-right price including NPV (Rs. 516 million ÷ 28 million shares)	18.43

(iii) **Current earnings per share**

Profit before interest and taxation	95.00
Less: Interest on debentures (Rs. 350 million @ 10%)	(35.00)
Profit before taxation	60.00
Less: taxation @ 35%	(21.00)
	39.00
Earnings per share (Rs. 39 million ÷ 20)	Rs.1.95
Price earnings ratio (Rs. 16 ÷ Rs. 1.95)	8.21

New earnings per share and share price

	Right issue	Debenture issue
	---------Rupees in million------	
Profit before interest and taxation (95.00 x 1.1)	104.50	104.50
Less: Debenture interest (10% × 350)	(35.00)	(35.00)
(9% × 100)	-	(9.00)
Profit before tax	69.50	60.50
Less: Taxation at 35%	24.33	21.18
	45.17	39.32
EPS (Rs. 45.17 million / 28 million shares)	Rs. 1.61	
New share price (Rs. 1.61 x 8.21)	Rs. 13.22	
EPS (Rs. 39.32 million / 20 million shares)		Rs. 1.97
New share price (Rs. 1.97 x 8.21 x 70%)		Rs. 11.31

(b) PSD already has a gearing level of 37% (350 ÷ 940). If it is at or near its optimal level of gearing, shareholders may take negatively to the additional debt which would push the gearing level up to 43% (450 ÷ 1,040). Accordingly the cost of equity would rise and the ordinary share price would fall.

(THE END)