SUGGESTED SOLUTION

CA FINAL EXAM

S F M

Test Code - F N J 2 0 0 2

BRANCH - (Mumbai) (Dt : 28/05/2017)

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Answer—1 : **(12 Marks)**

Discounting Factor:

Cost of finance 20% - Tax 35% = 13%.

(i) PV of cash outflows under leasing alternative

Year-end	Lease rent after taxes P.A.	PVIFA at 13%	Total P.V.
1 – 5	Rs. 3,90,000	3.517	Rs. 13,71,630

PV of cash outflows under buying alternative

Year End	Loan Instalment	Tax advantage on Interest	Taxadvantage on Depreciation	Net Cash Outflow	PVIF at 13%	Total PV
1	6,68,673	1,40,000	1,75,000	3,53,673	0.885	3,13,001
2	6,68,673	1,21,193	1,31,250	4,16,230	0.783	3,25,908
3	6,68,673	98,624	98,438	4,71,611	0.693	3,26,826
4	6,68,673	71,542	73,828	5,23,303	0.613	3,20,785
5	6,68,673	38,819	55,371	5,74,483	0.543	3,11,944
		Total PV outflows				15,98,464
		Less: PV of Salvage Value (Rs. 4,00,000 *0.543)				2,17,200
						13,81,264
		Less: PV of tax saving on short term capital loss (4,74,609 – 4,00,000) * 35% * .543				14,179
		NPV of Cash outflow				13,67,085

Working Notes:

(1) Schedule of Debt Payment

Year End	Opening balance	Interest @ 20%	Repayment	Closing Balance	Principal Amount
1	20,00,000	4,00,000	6,68,673	17,31,327	2,68,673
2	17,31,327	3,46,265	6,68,673	14,08,919	3,22,408
3	14,08,919	2,81,784	6,68,673	10,22,030	3,86,889
4	10,22,030	2,04,406	6,68,673	5,57,763	4,64,267
5	5,57,763	1,10,910*	6,68,673	0	5,57,763

*Balancing Figure

(2) Schedule of Depreciation

Year	Opening WDV	Depreciation	Closing WDV
1	20,00,000	5,00,000	15,00,000
2	15,00,000	3,75,000	11,25,000
3	11,25,000	2,81,250	8,43,750
4	8,43,750	2,10,938	6,32,812
5	6,32,812	1,58,203	4,74,609

(3) EMI = Rs. 20,00,000 / Annuity for 5 years @ 20% = i.e. Rs. 20,00,000 / 2.991 =Rs. 6,68,673.

Advice: Company is advised to borrow and buy not to go for leasing as NPV ofcash outflows is lower in case of buying alternative.

Note: Students may note that the cost of capital of the company given in thequestion is 14% at which cash flows may also be discounted; the question ishowever, silent whether this cost of capital is pre-tax or post tax. If it is assumedthat this is after tax cost and the cash flows are discounted at this rate there is nochange in the advice to the company i.e. borrow and buy. However, if it is assumedthat the cost of capital is pre-tax and the same is adjusted with the tax rate todiscount the cash flows, the advice to the company changes to leasing.

(ii) Evaluation from Lessor's Point of View

	(1)	(2)	(3)	(4)	(5)
Lease Rent	6,00,000	6,00,000	6,00,000	6,00,000	6,00,000
Less: Depreciation	5,00,000	3,75,000	2,81,250	2,10,938	1,58,203
EBT	1,00,000	2,25,000	3,18,750	3,89,062	4,41,797
Less: Tax @ 35%	35,000	78,750	1,11,563	1,36,172	1,54,629
EAT	65,000	1,46,250	2,07,187	2,52,890	2,87,168
Add: Depreciation	5,00,000	3,75,000	2,81,250	2,10,938	1,58,203
Cash Inflows	5,65,000	5,21,250	4,88,437	4,63,828	4,45,371
PV factor @ 14%	0.877	0.769	0.675	0.592	0.519
PV of inflows	4,95,505	4,00,841	3,29,695	2,74,586	2,31,148

Evaluation:

Aggregate PV of cash inflows	17,31,775
Add: PV of salvage value (4,00,000 × 0.519)	2,07,600
Add: Tax shelter on short-term capital loss (4,74,609 – 4,00,000) × 0.35 ×0.519	13,553
PV of all cash inflows	19,52,928
Cost of the machine	20,00,000
NPV	−47,072

Hence, leasing at this rate is not feasible.

Answer—2 : **(8 Marks)**

(i) Calculation of loan installment:

Rs.10,00,000 / (1+ PVIFA 12%, 4)

Rs.10,00,000 / (1 + 3.038) = Rs. 2,47,647

Debt Alternative: Calculation of Present Value of Outflows

(Amount in Rs.)

(1) End of Year	(2) Debt Payment	(3) Interest	(4) Dep.	(5) Tax Shield [(3)+(4)]x0.3	(6) Cash outflows (2) – (5)	(7) PV factors @ 10%	(8) PV
0	2,47,647	0	0	0	2,47,647	1.000	2,47,647
1	2,47,647	90,282	1,60,000	75,085	1,72,562	0.909	1,56,859
2	2,47,647	71,398	1,60,000	69,419	1,78,228	0.826	1,47,216
3	2,47,647	50,249	1,60,000	63,075	1,84,572	0.751	1,38,614
4	2,47,647	26,305*	1,60,000	55,892	1,91,755	0.683	1,30,969
5	0	0	1,60,000	48,000	(48,000)	0.621	(29,808)
							7,91,497
Less: Salvage Value Rs. 2,00,000 x 0.621							1,24,200
Total Present Value of Outflow							6,67,297

*balancing figure

Leasing Decision: Calculation of Present Value of Outflows

Yrs. 1-5 Rs.2,40,000 x (1 - 0.30) x 3.790 = Rs.6,36,720

Decision: Leasing option is viable.

(ii) From Lessor's Point of View

		(Rs.)
Cost of Machine		(-) 10,00,000
PV of Post tax lease Rental (Rs.2,40,000 x 0.7 x 3.605)	6,05,640	
PV of Depreciation tax shield (Rs.1,60,000 x 0.3 x 3.605)	1,73,040	
PV of salvage value (Rs.2,00,000 x 0.567)	1,13,400	8,92,080
NPV		(-) 1,07,920

Decision – Leasing proposal is not viable.

Answer—3 : **(8 Marks)**

A & Co.

Equivalent cost of (EAC) of new machine

		Rs.
(i)	Cost of new machine now	90,000
	Add: PV of annual repairs @ Rs. 10,000 per annum for 8 years (Rs. 10,000 × 4.4873)	44,873
		1,34,873
	Less: PV of salvage value at the end of 8 years (Rs.20,000×0.3269)	6,538
		1,28,335
	Equivalent annual cost (EAC) (Rs. 1,28,335/4.4873)	28,600

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

Scenario	Year	Cash Flow (Rs.)	PV @ 15%	PV (Rs.)
Replace Immediately	0	(28,600)	1.00	(28,600)
		40,000	1.00	40,000
				11,400
Replace in one year	1	(28,600)	0.870	(24,882)
	1	(10,000)	0.870	(8,700)
	1	25,0000	0.870	21,750
				(11,832)
Replace in two years	1	(10,000)	0.870	(8,700)
	2	(28,600)	0.756	(21,622)
	2	(20,000)	0.756	(15,120)
	2	15,000	0.756	11,340
				(34,102)
Replace in three years	1	(10,000)	0.870	(8,700)
	2	(20,000)	0.756	(15,120)
	3	(28,600)	0.658	(18,819)
	3	(30,000)	0.658	(19,740)
	3	10,000	0.658	6,580
				(55,799)
Replace in four years	1	(10,000)	0.870	(8,700)
	2	(20,000)	0.756	(15,120)
	3	(30,000)	0.658	(19,740)
	4	(28,600)	0.572	(16,359)
	4	(40,000)	0.572	(22,880)
				(82,799)

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

Answer—4 : **(6 Marks)**

(a) M/s XY Ltd.

(i) Walter's model is given by

$$P = \frac{D+(E-D)(r/k_e)}{K_e}$$

Where,

P = Market price per share.

E = Earnings per share = Rs.5

D = Dividend per share = Rs.3

r = Return earned on investment = 15%

K_e = Cost of equity capital = 12%

$$P = \frac{3+(5-3)\ x\ \frac{0.15}{0.12}}{0.12} = \frac{3+2\ x\ \frac{0.15}{0.12}}{0.12}$$

= Rs.45.83

(ii) According to Walter's model when the return on investment is more than the cost of equity capital, the price per share increases as the dividend pay-out ratiodecreases.Hence, the optimum dividend pay-out ratio in this case is nil.
So, at a pay-out ratio of zero, the market value of the company's share will be:

$$\frac{0+(5-0)\frac{0.15}{0.12}}{0.12} = \text{Rs.}52.08$$

Answer—5 : **(6 Marks)**

Modigliani and Miller (M-M) – Dividend Irrelevancy Model:

$$P_0 = \frac{P_1 + D_1}{1+K_e}$$

Where,

P_0 = Existing market price per share i.e. Rs. 120

P_1 = Market price of share at the year-end (to be determined)

D_1 = Contemplated dividend per share i.e. Rs. 6.4

K_e = Capitalisation rate i.e. 9.6%.

(i) (a) Calculation of share price when dividend is declared:

$$P_0 = \frac{P_1 + D_1}{1+K_e}$$

$$120 = \frac{P_1 + 6.4}{1+0.096}$$

$120 \times 1.096 = P1 + 6.4$

$P_1 = 120 \times 1.096 - 6.4$

$= 125.12$

(b) Calculation of share price when dividend is not declared:

$$P_0 = \frac{P_1 + D_1}{1+K_e}$$

$$120 = \frac{P_1 + 0}{1+0.096}$$

$120 \times 1.096 = P1 + 0$

$P_1 = 131.52$

(ii) Calculation of No. of shares to be issued:

(Rs. in lakhs)

Particulars	**If dividenddeclared**	**If dividend notDeclared**
Net Income	160	160
Less: Dividend paid	51.20	------
Retained earnings	108.80	160
Investment budget	320	320
Amount to be raised by issue of new shares (i)	211.	20 160
Market price per share (ii)	125.12	131.52
No. of new shares to be issued (ii)	1,68,797.95	1,21,654.50
Or say	1,68,798	1,21,655

Answer—6 : **(8 Marks)**

Year Period	X Security Returns % $\frac{P_1 - P_0 + D}{P_0}$ x 100	Y Market Returns % $\frac{P_1 - P_0}{P_0}$ x 100 + Div yield	16.13 13.28 $(x-\bar{x})$ $(y-\bar{y})$	$(y-\bar{y})^2$
10—11	$\frac{147-139+8.5}{139}$x100=12.58%	$\frac{1495-1300}{1300}$x100+5%=20%	—3.55 x 6.72 = —23.86	45.16
11—12	$\frac{163-147+9}{147}$x100=17.01	$\frac{1520-1495}{1495}$x100+5.5%=7.17%	0.88x—6.11=—5.38	37.33
12—13	$\frac{179-163+9.5}{163}$x100=15.64%	$\frac{1640-1520}{1520}$x100+4.75%=12.64%	—0.49 x —0.64 = 0.31	0.4096
13—14	$\frac{203.51-179+10}{179}$x100=19.28%	$\frac{1768-1640}{1640}$x100+5.5%=13.30%	3.15 x .02=0.063	0.0004
	64.51%	53.11%	—28.86	82.90

$\bar{x}$[Average Returns Securely] $= \frac{\sum x}{n} = \frac{64.51}{y} = 16.13\%$

$\bar{y}$ = Average Returns Market = $\frac{\sum y}{n} = \frac{53.11}{y} = 13.28\%$

$$\beta = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sum(y-\bar{y})^2} = \frac{-28.86}{82.90}$$

$$= -0.35 \text{ apprx}$$