9. LEASE FINANCING

ASSIGNMENT SOLUTIONS

PROBLEM NO: 1

EVALUATION OF LEASE OPTION:

Cost of Debt = 13.4862 (1-.35) % = 9%

Step: 1 Cost of the Asset = Rs. 4000000

Step: 2 PV of Tax Shield on depreciation

Yr.	Dep (Rs.)	Tax @ 35% (Rs.)	PV @ 9%	PV of Tax Shield on Dep (Rs.)
1	1600000	560000	0.9174	513744
2	960000	336000	0.8417	282811
3	576000	201600	0.7722	155676
4	345600	120960	0.7084	85688
5	207360	72576	0.6499	47167
Total	**3688960**	**1291136**		**1085086**

Step: 3 Terminal Value

			Rs.
(a)	Salvage Value of Asset		**1000000**
	WDV of Asset		
	Cost	4000000	
	Less: Acc. Dep	3688960	311040
	Profit:		688960
(b)	TAX outflow on Profit		**241136**
Therefore, terminal cash flow (a)-(b)			**758864**
	PV of terminal cash flows		**493186**

Step: 4 Computation of PV of Net Lease Rent

	Rs.
Lease rent per annum	875000
Less: Tax on lease rent	306250
Net Lease rent	568750
PVAF @ 9%, 5y	3.8896
PV of Net lease rents	**2212210**

Net Present Value of Leasing (NPV) = Cost of Asset - PV of tax shield on Depreciation -PV of Salvage Value - PV of Net Lease rentals.

NPV of Lease = 4000000 - 1085086-493186-2212210 = Rs. 209518

Since NAV is Positive, it is advised to exercise the Lease option.

Alternatively, WACC may be used as 'Discounting factor'.

PROBLEM NO: 2

EVALUATION OF LEASE OPTION:

Cost of Debt = 15 (1-.40) % = 9%

Step: 1 Cost of the Asset = 5000000

Step: 2 PV of Tax Shield on depreciation

Yr.	Dep (Rs.)	Tax @ 40% (Rs.)	PV @ 9%	PV of Tax Shield on Dep (Rs.)
1	1250000	437500	0.9174	401362.5
2	937500	328125	0.8417	276183
3	703125	246094	0.7722	190034
4	527344	184570	0.7084	130750
5	395508	138428	0.6499	89964
Total	3813477	1334717		**1088293**

Step: 3 Terminal Value

			Rs.
(a)	Salvage Value of Asset		**600000**
	WDV of Asset		
	Cost	5000000	
	Less: Acc. Dep	3813477	1186523
	Loss		-586523
(b)	TAX saving on loss		**234609**
Therefore, terminal cash flow (a)+(b)			**834609**
	PV of terminal cash flows		**542413**

Step: 4 Computation of PV of Net Lease Rent

	Rs.
Lease rent per annum	1200000
Less: Tax on lease rent	480000
Net Lease rent	720000
PVAF @ 9%, 5y	3.8896
PV of Net lease rents	**2800512**

Net Present Value of Leasing (NPV) = Cost of Asset - PV of tax shield on Depreciation -PV of Salvage Value - PV of Net Lease rentals.

NPV of Lease = 5000000 - 1088293-542413-2800512 = Rs. 568782

Since NPV is Positive, it is advised to exercise the Lease option.

Alternatively, WACC may be used as 'Discounting factor'.

PROBLEM NO: 3

EVALUATION OF LEASE OPTION:

Cost of Debt = 12 (1-0.3) % = Rs. 8.4%

Step: 1 Cost of the Asset = Rs. 60000

Step: 2 PV of Tax Shield on depreciation

	Rs.
Depreciation per annum	12000
Tax@30%	3600
PV of Tax shied on Dep	
(PVAF@8.4%,5)	3.951
	14224

Step: 3 Terminal Value

		Rs.
	Sale Value	1500
	WDV of Asset	0
		1500
	less: Commission @ 8%	120

	Profit	1380
	Tax outflow on profit	**414**
Therefore, Net terminal cash flow		**966**
	PVF @ (8.4%, 5) = 0.668	**645**

Step: 4 Computation of PV of Net Lease Rent

Lease rent per annum	X
Less: Tax on lease rent	0.3X
Net Lease rent	0.7X
PVAF @8.4%, 5y	3.951
PV of Net lease rents	**2.7657 X**

Net Present Value of Leasing (NPV) = Cost of Asset - PV of tax shield on Depreciation -PV of Salvage Value - PV of Net Lease rentals.

NPV = 60000-14224-645-2.7657X = 0

2.7657 X = 60000-14224-645

X = 16318

Therefore, Maximum lease rental matching with loan option for Laxmi enterprise is Rs. 16,318.

Alternatively, WACC may be used as 'Discounting factor'.

PROBLEM NO: 4

EVALUATION OF LEASE OPTION:

Cost of Debt = 15 (1-.35) % = 9.75%

Step: 1 Cost of the Asset = Rs. 1000000

Step: 2 PV of Tax Shield on depreciation

Year	Dep. (Rs.)	Tax @ 35% (Rs.)	PV @ 9.75%	PV of Tax Shield on Dep (Rs.)
1	150000	52500	0.911	47828
2	127500	44625	0.830	37039
3	108375	37931	0.756	28676
4	92119	32242	0.689	22214
5	78301	27405	0.628	17211
Total	556295	194703		**152968**

Step: 3 Terminal Value

			Rs.
(a)	Salvage Value of Asset		0
	WDV of Asset		
	Cost	1000000	
	Less: Acc. Dep	556295	443705
	Loss:		-443705
(b)	TAX Saving on loss		155297
Therefore, terminal cash flow (a)+(b)			155297
	PV of Terminal Value		**97526**

Since salvage value of the asset is taken as zero, the closing WDV of the asset shall be considered as the loss.

Step: 4 Computation of PV of Net Lease Rent

	Rs.
Lease rent per annum	334000
Less: Tax on lease rent	116900
Net Lease rent	217100
PVAF @9.75%, 5y	3.814
PV of Net lease rents	**828019**

Net Present Value of Leasing (NPV) = Cost of Asset - PV of tax shield on Depreciation -PV of Salvage Value - PV of Net Lease rentals.

NPV of Lease = 10,00,000 - 152968- 97526- 828019= **- (Rs. 78513)**

Since NPV is Negative, it is suggested to acquire the asset on borrow option.

Alternatively, WACC may be used as 'Discounting factor'.

PROBLEM NO: 5

EVALUATION OF LEASE OPTION:

Cost of Debt = 14 (1-.35) % = 9.10%

Step: 1 Cost of the Asset

Cost of the Asset	**Rs.**
Cost	3000000
Add: CST @ 10%	300000
	3300000

Step: 2 PV of Tax Shield on depreciation

Year	Dep (Rs.)	Tax @ 35% (Rs.)	PV @ 9.10%	PV of Tax Shield on Dep (Rs.)
1	825000	288750	0.917	264784
2	618750	216563	0.840	181913
3	464063	162422	0.77	125065
4	348047	121816	0.706	86002
5	261035	91363	0.647	59111
Total	2516895	880913		**716875**

Step: 3 Terminal Value

		Rs.
	Salvage Value of Asset	330000
Therefore, PV of terminal cash flow		**213510**

WN: 1 - Other Initial Costs payable at the end of Year 1 = Rs. 80000

PV of Initial expenses net of Tax = Rs. 80000 x 0.917 x 65% = Rs. 47684.

Computation of Break-even lease rentals (BELR)

Let 'x' be the post tax Lease rent

We have, CFAT X PVAF = Cash outflows

PV of Post Tax Lease rent + PV of Tax Shied on dep + PV of Salvage value = cost + PV of initial Expenses

3.88 X + 716875+213510 =3300000+47684

3.88 X = =3300000+47684-716875-213510 = 2417299

Lease rent After tax (X)= Rs. 623015

Lease rent before Tax = 623015/.65 = **Rs. 958485**

Note: Since in the problem Specific cost is not given, it is assumed that WACC as a specific cost.

PROBLEM NO: 6

EVALUATION OF LEASE OPTION:

Cost of Debt = 12(1-0.3)% = 8.4%

Step: 1 Cost of the Asset = Rs. 1000000

Step: 2 PV of Tax Shield on depreciation

	Rs.
Depreciation per annum	160000
Tax@30%	48000
PV of Tax shied on Dep	
(PVAF@8.4%,5)	3.951
	189648

Step: 3 Terminal Value

	Rs.
Salvage Value	**200000**
PVF @ (8.4%, 5)	**0.668**
PV of terminal CFS	**133600**

Step: 4 Computation of PV of Net Lease Rent

	Rs.
Lease rent per annum	240000
Less: Tax on lease rent	72000
Net Lease rent	168000
PVAF @ 8.4%, 5y	3.951
PV of Net lease rents	**663768**

Net Present Value of Leasing (NPV) = Cost of Asset - PV of tax shield on Depreciation -PV of Salvage Value - PV of Net Lease rentals.

NPV = 1000000-189648-133600-663768 = Rs. 12984

Since NPV is Positive, it is advised to exercise the Lease option
Alternatively, WACC may be used as 'Discounting factor'.

(ii) Evaluation of Lease option in the lessors perspective

Cost of Debt = 12%

Step: 1 Cost of the Asset = Rs. 1000000

Step: 2 PV of Tax Shield on depreciation

	Rs.
Depreciation per annum	160000
Tax@30%	48000
PV of Tax shied on Dep	
(PVAF@10%,5)	3.605
	173040

Step: 3 Terminal Value

	Rs.
Salvage Value	**200000**
PVF @ (12%, 5)	**0.567**
PV of terminal CFS	**113400**

Step: 4 Computation of PV of Net Lease Rent

	Rs.
Lease rent per annum	240000
Less: Tax on lease rent	72000
Net Lease rent	168000
PVAF @12%, 5y	3.605
PV of Net lease rents	**605640**

Net Present Value of Leasing (NPV) = Cost of Asset - PV of tax shield on Depreciation -PV of Salvage Value - PV of Net Lease rentals.

NPV = 173040+113400+605640-1000000 = **- (Rs. 107920)**

Since NPV is negative, it is not advised to exercise the Lease option.

PROBLEM NO: 7

EVALUATION OF LEASE OPTION:

Cost of Debt = 15(1-.50) % = 7.5%

Step: 1 Cost of the Asset = Rs. 110000
Down Payemnt-10000

Step: 2 PV of Tax Shield on depreciation

	Rs.
Depreciation per annum	11000
Tax@50%	5500
PV of Tax shied on Dep	
(PVAF@7.5%,10)	6.866
	37763

Step: 3 Terminal Value

	Rs.
Salvage Value	**20000**
PVF @ (7.5%, 0.485)	**0.485**
PV of terminal CFS	**9700**

Step: 4 Computation of PV of Net Lease Rent

	Rs.
Lease rent per annum	15000
Less: Tax on lease rent	7500
Net Lease rent	7500
PVAF @ 7.5%, 10	6.866
PV of Net lease rents	**51495**

Net Present

Value of Leasing (NPV) = Cost of Asset - PV of tax shield on Depreciation -PV of Salvage Value - PV of Net Lease rentals.

NPV = 110000-37763-9700-51495 = Rs. 11042

Since NPV is Positive, it is advised to exercise the Lease option.

Alternatively, WACC may be used as 'Discounting factor'.

PROBLEM NO: 8

a) EVALUATION OF LEASE OPTION:

Cost of Debt = 20 (1-0.35)% = 13%

Step: 1 Cost of the Asset = Rs. 1500000

Step: 2 PV of Tax Shield on depreciation

Yr.	Dep. (Rs.)	Tax @ 35% (Rs.)	PV @ 13%	PV of Tax Shield on Dep (Rs.)
1	375000	131250	0.885	116156
2	281250	98438	0.783	77077

3	210938	73828	0.693	51163
4	158203	55371	0.613	33942
5	118652	41528	0.543	22550
Total	**1144043**	**400415**		**300888**

Step: 3 Terminal Value

			Rs.
(a)	Salvage Value of Asset		100000
	WDV of Asset		
	Cost	1500000	
	Less: Acc. Dep	1144043	355957
	Loss:		-255957
(b)	TAX Saving on loss		**89585**
Therefore, terminal cash flow (a)+ (b)			**189585**
	PV		**102945**

Step: 4 Computation of PV of Net Lease Rent

	Rs.
Lease rent per annum	450000
Less: Tax on lease rent	157500
Net Lease rent	292500
PVAF @ 13%, 5y	3.517
PV of Net lease rents	**1028723**

Net Present Value of Leasing (NPV) = Cost of Asset - PV of tax shield on Depreciation -PV of Salvage Value - PV of Net Lease rentals.

NPV = 1500000-300888-102945-1028723 = Rs. 67,444

Since NAV is Positive, it is advised to exercise the Lease option

Alternatively, WACC may be used as 'Discounting factor'.

Note: 1 Maintenance Expense of the Machine is a common cost for both options. Hence ignored.

b) Computation of NPV to the lessor

For lessor, leasing is the investment decision. It must be evaluated by NPV or IRR techniques

Year	Cash flows	After Tax Lease rent	Tax shield on Depreciation	Salvage Value	Net cash flows	PVAF@ 14%	PVCF
0	-1500000				-1500000	1	-1500000
1		292500	131250		423750	0.877	371629
2		292500	98438		390938	0.769	300631
3		292500	73828		366328	0.675	247271
4		292500	55371		347871	0.592	205940
5		292500	41528	189585	523613	0.519	271755
NPV							**-102774**

Since, NPV is Negative, the lease proposal is not acceptable in the lessor perspective.

c) Computation of Break even lease rentals (BELR) - @ 14% Discount rate

Let 'x' be the post tax Lease rent

WN:1 PV of Tax Shield on depreciation

Yr.	Dep (Rs.)	Tax @ 35% (Rs.)	PV @ 14%	PV of Tax Shield on Dep (Rs.)
1	375000	131250	0.877	115106
2	281250	98438	0.769	75698
3	210938	73828	0.675	49834
4	158203	55371	0.592	32780
5	118652	41528	0.519	21553
Total	**1144043**	400415		**294972**

We have, CFAT X PVAF = Cash outflows

(PV of Post Tax Lease rent) + (PV of Tax Shied on dep.) + (PV of Salvage Value) = 1500000

(3.432 X) + (294972) +(189585 x 0.519) = 1500000

3.432 X +294972 + 98394.62 = 1500000

3.432 X = =1500000-294972-98394.62

X = Rs. 322446

Lease rent After tax = Rs. 322446

Lease rent before Tax = 322446/0.65 = Rs. 4,96,071

d) Computation of LEASE RENT WHEN NPV = RS. 100000 - @ 14% Discount rate

Let 'x' be the post tax Lease rent

We have, CFAT X PVAF = Cash outflows

(PV of Post Tax Lease rent) + (PV of Tax Shied on dep.) + (PV of Salvage Value) = 1500000 + 100000

(3.432 X) + (294972) + (189585 x 0.519) = 1600000

3.432 X = 1600000-294972-98394.62

X = Rs. 351583

Lease rent after tax = Rs. 351583

Lease rent before Tax = 351583/0.65 = Rs. 540897

PROBLEM NO: 9

i) EVALUATION OF LEASE OPTION:

Cost of Debt = 20 (1-0.35)% = 13%

Step: 1 Cost of the Asset = Rs. 2000000

Step: 2 PV of Tax Shield on depreciation

Yr.	Dep. (Rs.)	Tax @ 35% (Rs.)	PV @ 13%	PV of Tax Shield on Dep (Rs.)
1	500000	175000	0.885	154875
2	375000	131250	0.783	102769
3	281250	98438	0.693	68217
4	210938	73828	0.613	45257
5	158203	55371	0.543	30067
Total	**1525391**	533887		**401184**

Step: 3 Terminal Value

			Rs.
(a)	Salvage Value of Asset		400000
	WDV of Asset		
	Cost	2000000	

	Less: Acc. Dep	1525391	474609
	Loss:		-74609
(b)	TAX Saving on loss		**26113**
Therefore, terminal cash flow (a)+ (b)			**426113**
	PV		**231380**

Step: 4 Computation of PV of Net Lease Rent

	Rs.
Lease rent per annum	600000
Less: Tax on lease rent	210000
Net Lease rent	390000
PVAF @ 13%, 5y	3.517
PV of Net lease rents	**1371630**

Net Present Value of Leasing (NPV) = Cost of Asset - PV of tax shield on Depreciation -PV of Salvage Value - PV of Net Lease rentals.

NPV = 2000000-401184-231380-1371630= -(Rs. 4194)

Since NPV is Negative, it is advised to exercise borrow & buy option

Alternatively, WACC may be used as 'Discounting factor'.

ii) Computation of NPV to the lessor

For lessor, leasing is the investment decision. It must be evaluated by NPV or IRR techniques

Year	Cash flows	After Tax Lease rent	Tax shield on Depreciation	Salvage Value	Net cash flows	PVAF@ 14%	PVCF
0	-2000000				-2000000	1	-2000000
1		390000	175000		565000	0.877	495505
2		390000	131250		521250	0.769	400841
3		390000	98438		488437.5	0.675	329695
4		390000	73828		463828.1	0.592	274586
5		390000	55371	426113	871484.1	0.519	452300
NPV							**-47072**

Since, NPV is Negative, the lease proposal is not acceptable in the lessor perspective.

PROBLEM NO: 10

a) EVALUATION OF LEASE OPTION:

Cost of Debt = 16(1-0.50)% = 8%

Step: 1 Cost of the Asset = Rs. 5000000

Step: 2 PV of Tax Shield on depreciation

	Rs.
Depreciation per annum	750000
Tax@ 50%	375000
(PVAF@8%,4)	3.312
PV of Tax shied on Dep	**1242000**

Step: 3 Terminal Value

	Rs.
Salvage Value of Asset	2000000
PVF @ (8%, 4)	0.735
PV of Terminal cash flow	**1470000**

Step: 4 Computation of PV of Net Lease Rent

	Rs.
Lease rent per annum	1000000
Less: Tax on lease rent	500000
Net Lease rent	500000
PVAF @ 8%, 4y	3.312
PV of Net lease rents	**1656000**

Net Present Value of Leasing (NPV) = Cost of Asset - PV of tax shield on Depreciation -PV of Salvage Value - PV of Net Lease rentals.

NPV = 5000000-1422000-1470000-1656000= Rs. 4,52,000

Since NPV is Positive, it is advised to exercise Lease option

Alternatively, WACC may be used as 'Discounting factor'.

b) Computation of NPV to the lessor

For lessor, leasing is the investment decision. It must be evaluated by NPV or IRR techniques

Year	Cash flows	After Tax Lease rent	Tax shield on Depreciation	Salvage Value	Net cash flows	PVAF@ 14%	PVCF
0	-5000000				-5000000	1	-5000000
Y1-3		500000	375000		875000	2.321	2030875
Y4		500000	375000	2000000	2875000	0.592	1702000
			NPV				**-1267125**

Since, NPV is Negative, the lease proposal is not acceptable in the lessor perspective.

c) Computation of Minimum rent which will yield IRR 16% to the lessor.

Let desired CFAT to earn a return of 16%is X, then

$$Rs.50,00,000 = \sum_{t=1}^{4} \frac{X}{(1+0.16)} + \frac{Rs.20,00,000}{(1+0.16)^4}$$

Rs.50,00,000 = X (2.798) + Rs.20,00,000 (0.552)

Rs.50,00,000 = 2.798X + 11,04,582

Rs.38,95,418 = 2.798 X, X =Rs.13,92,215

Thus, lease rent for IRR of16% should be Rs.13,92,215.

PROBLEM NO: 11

a) Let equated annual lease rentals be X

$$\text{Then, } X = \frac{\text{Investment Cost}}{\text{PVIFA}}(24\%,5)$$

$$X = \frac{\$5\,\text{million}}{2.745}$$

$$X = \frac{\$5,000,000}{2.745}$$

X = $ 18,21,500 (Equated annual lease rentals)

b) Let stepped lease rental (assuming annual increase of 15 per cent annually) be X:

Then, X x PVIF (24%, 1) + PVIF (24%, 2) + $(1.15)^2$ X x PVIF (24%,3) + $(1.15)^3$ X x PVIF (24%,4) + $(1.15)^4$ X x PVIF (24%,5) = $5 Million

i.e. 0.806X + 0.7475X + 0.693X+ 0.5964X= $5 Million

3.4862X = $ Million

$$X = \frac{\$5,000,000}{3.4862} = \$1,434,226$$

Lease rentals (year wise)

Year	1	2	3	4	5
Lease rent	$1,434,226	$1,649,360	$1,896,760	$2,181,280	$2,508,470

c) Deferred lease rental (deferment of 2 years)

Denoting X as the equated annual rental to be charged between Years 3 – 5,

X x PVIF (24%, 3) + X x PVIF (24%, 4) + X x PVIF (24%, 5) = $ 5million

0.524X + 0.423X + 0.341X = $5 Million

$$X = \frac{\$5,000,000}{1.288} = \$3.882\,\text{million i.e.}\,\$3,882,000$$

PROBLEM NO: 12

Capital sum to be placed under Lease

	Rs. in lakhs	
Cash Down price of machine	300.00	
Less: Present value of depreciation		
Tax Shield		
$100 \times 0.35 \times \frac{1}{(1.10)}\ 31.82$		
100 x 0.35 x [1 / (1.10)2]	28.93	
100 x 0.35 x [1 / (1.10)3]	26.30	87.05
	212.95	

If the normal annual lease rent per annum is x, then cash flow will be:

Year	Post-tax cash flow	P.V. of post-tax cash flow
1	3x x (1 - .35) = 1.95x	1.95 x (1/1.10) = 1.7727x
2	2x x (1 - .35) = 1.3x	1.30 x [(1/(1.10)2] = 1.0743x
3	x x (1 - .35) = 0.65x	0.65 x [1/(1.10)3] = 0.4884x
		3.3354x

Therefore 3.3354 X = 212.95 or X = Rs. 63.8454 lakhs

Year-wise lease rentals:

Year		Rs. in lakhs
1	3 x 63.8454 lakhs	= 191.54
2	2 x 63.8454 lakhs	= 127.69
3	1 x 63.8454 lakhs	= 63.85

THE END