

**CA FINAL (NEW SCHEME)
NOVEMBER 2020 – SOLVED EXAM PAPER
STRATEGIC FINANCIAL MANAGEMENT**

Question 1(a) [8 Marks]:

ZX Ltd., has made purchases worth USD 80,000 on 1st May 2020 for which it has to make a payment on 1st November 2020. The present exchange rate is INR/USD 75. The company can purchase forward dollars at INR/USD 74. The company will have to make an upfront premium @ 1 per cent of the forward amount purchased. The cost of funds to ZX is 10 per cent per annum.

The company can hedge its position with the following expected rate of USD in foreign exchange market on 1st May 2020:

Exchange Rate	Probability
INR/USD 77	0.15
INR/USD 71	0.25
INR/USD 79	0.20
INR/USD 74	0.40

You are required to advise the company for a suitable cover for risk.

Solution

Cost of entering into Forward Contract:

	Rs.
Upfront Premium [80000USD X Rs. 74 per USD X 1%]	59,200
Add: Cost of Funds for 6 months [Rs. 59,200 X 10% X 6/12]	2,960
	62,160

Calculation of Pay-off on Expiry Date:

	If Exchange Rate is-			
	Rs. 77	Rs. 71	Rs. 79	Rs. 74
Value on Expiry per \$ (Rs.)	3.00	-3.00	5.00	0
Value on Expiry for the Contract (Rs.)	240000	-240000	400000	0
Cost of entering into Forward	-62160	-62160	-62160	-62160
Net Pay-off	177840	-302160	337840	-62160

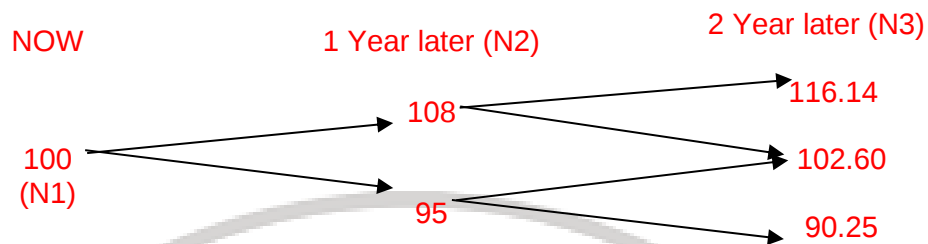
Calculation of Expected Pay-off on Expiry:

If INR/USD on Expiry Date is-	Net Pay-off (Rs.)	Probability	Net Pay-off X Probability
77	177840	0.15	26676
71	(-)302160	0.25	(-) 75,540
79	337840	0.20	67,568
74	(-) 62160	0.40	(-)24,864
			(-)6,160

The average pay-off on the Forward is expected to be negative on 1st November. Hence, it is not advisable to use Forward for hedging foreign currency risk.

Question 1(b) [8 Marks]:

A two-year tree for a share of stock in ABC Ltd., is as follows:



Consider a two-year American Call Option on the stock of ABC Ltd., with a strike price of Rs. 98. The current price of the stock is Rs. 100. Risk-free return is 5 per cent per annum with a continuous compounding and $e^{0.05} = 1.05127$.

Assume two time periods of one year each.

Using the Binomial model, calculate:

- The probability of price moving up and down;
- Expected pay-offs at each node i.e., N1, N2 and N3 (round off up to 2 decimal points)

Solution

(i) Calculation of Probabilities

Let 'x' be the probability of Higher S_1 (i.e., Rs. 108).

Then, (1-x) will be the probability of Lower S_1 (i.e., Rs. 95)

Then,

$$\left[\frac{\text{Higher } S_1 - S_0}{S_0} \right] x + \left[\frac{\text{Lower } S_1 - S_0}{S_0} \right] (1-x) = e^{rt} - 1$$

So,

$$\left[\frac{\text{Rs. } 108 - \text{Rs. } 100}{\text{Rs. } 100} \right] x + \left[\frac{\text{Rs. } 95 - \text{Rs. } 100}{\text{Rs. } 100} \right] (1-x) = 1.05127 - 1$$

That is,

$$0.08x + (-0.05)(1-x) = 0.05127$$

$$0.08x - 0.05 + 0.05x = 0.05127$$

$$0.13x = 0.05127 + 0.05 = 0.10127$$

$$\text{So, } x = \frac{0.10127}{0.13} = \mathbf{0.779}$$

$$(1-x) = 1 - 0.779 = \mathbf{0.221}$$

Therefore,

Probability of Upward movement is 0.779

Probability of Downward movement is 0.221

(ii) Expected Pay-off at each Node (under Binomial Model)

$r = 5\%$

$t = 1 \text{ Year}$

$S_0, e^{rt} = e^{0.05} = 1.05127$

Case (i): Node N_2 [Between Year 1 and Year 2 (When S_0 is Rs. 108)]

$S_0 = \text{Rs. } 108$

$S_1 = \text{Rs. } 102.60 \text{ and } 116.64$

$E = \text{Rs. } 98$

S_1	$C_1 [\text{Max}(S-E, 0)]$
102.60	4.60
116.64	18.64

Buy Δ Stock and Sell 1 Call Option

$$\Delta = \frac{\text{Spread in } C_1}{\text{Spread in } S_1} = \frac{\text{Rs. } 18.64 - \text{Rs. } 4.60}{\text{Rs. } 116.64 - \text{Rs. } 102.60} = \frac{\text{Rs. } 14.04}{\text{Rs. } 14.04} = 1$$

So, Buy 1 Units of Stock and Sell 1 Call Option.

Symbolically, $\Delta S_0 - C_0 = 1S_0 - C_0$

Calculate the 'value of Portfolio' on the Expiry date of Option

Value of the Underlying on Expiry Date (S_1)	Value of Stock on the date of Option Expiry (No. of Units X S_1)	Value of Call Option Sold on Expiry [$\text{Min}(E-S, 0)$]	Total Value of the Portfolio
102.60	1 X 102.60 = 102.60	-4.60	98.00
116.64	1 X 116.64 = 116.64	-18.64	98.00

Value of 'hedged portfolio' on expiry: Rs. 98.00

$$\text{Present value of the portfolio} = \frac{\text{Value of Portfolio on expiry date}}{e^{rt}} = \frac{\text{Rs. } 98}{1.05127} = \text{Rs. } 93.22$$

That is,

$$1S_0 - C_0 = \text{Rs. } 93.22$$

$$(1 \times \text{Rs. } 108) - C_0 = \text{Rs. } 93.22$$

$$\text{Rs. } 108 - C_0 = \text{Rs. } 93.22$$

$$\text{So, } C_0 = \text{Rs. } 108 - \text{Rs. } 93.22 = \text{Rs. } 14.78$$

Case (ii): Node N_3 [Between Year 1 and Year 2 (When S_0 is Rs. 95)]

$S_0 = \text{Rs. } 95$

$S_1 = \text{Rs. } 90.25 \text{ and } 102.60$

$E = \text{Rs. } 98$

S_1	$C_1 [\text{Max}(S-E, 0)]$
90.25	0
102.60	4.60

Buy Δ Stock and Sell 1 Call Option

$$\Delta = \frac{\text{Spread in } C1}{\text{Spread in } S1} = \frac{\text{Rs. } 4.60 - \text{Rs. } 0}{\text{Rs. } 102.60 - \text{Rs. } 90.25} = \frac{\text{Rs. } 4.60}{\text{Rs. } 12.35} = 0.3725$$

So, Buy 0.3725 Units of Stock and Sell 1 Call Option.

Symbolically, $\Delta S_0 - C_0 = 0.3725S_0 - C_0$

Calculate the 'value of Portfolio' on the Expiry date of Option

Rs.			
Value of the Underlying on Expiry Date (S_1)	Value of Stock on the date of Option Expiry (No. of Units X S_1)	Value of Call Option Sold on Expiry [$\text{Min}(E-S, 0)$]	Total Value of the Portfolio
90.25	$0.3725 \times 90.25 = 33.62$	0	33.62
102.60	$0.3725 \times 102.60 = 38.22$	-4.60	33.62

Value of 'hedged portfolio' on expiry: Rs. 33.62

Present value of the portfolio: $= \frac{\text{Value of Portfolio on expiry date}}{e^{rt}} = \frac{\text{Rs. } 33.62}{1.05127} = \text{Rs. } 31.98$

That is,

$$0.3725S_0 - C_0 = \text{Rs. } 31.98$$

$$(0.3725 \times \text{Rs. } 95) - C_0 = \text{Rs. } 31.98$$

$$\text{Rs. } 35.39 - C_0 = \text{Rs. } 31.98$$

$$\text{So, } C_0 = \text{Rs. } 35.39 - \text{Rs. } 31.98 = \text{Rs. } 3.41$$

Case (iii): Node N_1 [Between Now and Year 1 (When S_0 is 100)]

$S_0 = \text{Rs. } 100$

$S_1 = \text{Rs. } 95 \text{ and } \text{Rs. } 108$

$E = \text{Rs. } 98$

S_1	$C_1 [\text{Max}(S-E, 0)]$
95	3.41
108	14.78

Buy Δ Stock and Sell 1 Call Option

$$\Delta = \frac{\text{Spread in } C1}{\text{Spread in } S1} = \frac{\text{Rs. } 14.78 - \text{Rs. } 3.41}{\text{Rs. } 108 - \text{Rs. } 95} = \frac{\text{Rs. } 11.37}{\text{Rs. } 13.00} = 0.8746$$

So, Buy 0.8746 Units of Stock and Sell 1 Call Option.

Symbolically, $\Delta S_0 - C_0 = 0.8746S_0 - C_0$

Calculate the 'value of Portfolio' on the Expiry date of Option

Rs.			
Value of the Underlying on Expiry Date (S ₁)	Value of Stock on the date of Option Expiry (No. of Units X S ₁)	Value of Call Option Sold on Expiry [Min(E-S,0)]	Total Value of the Portfolio
95	0.8746 X 95 = 83.09	- 3. 41	79.68
108	0.8746 X 108 = 94.46	-14.78	79.68

Value of 'hedged portfolio' on expiry: Rs. 79.68

Present value of the portfolio: $= \frac{\text{Value of Portfolio on expiry date}}{e^{rt}} = \frac{\text{Rs. 79.68}}{1.05127} = \text{Rs. 75.79}$

That is,

$$0.8746S_0 - C_0 = \text{Rs. 75.79}$$

$$(0.8746 \times \text{Rs. 100}) - C_0 = \text{Rs. 75.79}$$

$$\text{Rs. 87.46} - C_0 = \text{Rs. 75.79}$$

$$S_0, C_0 = \text{Rs. 87.46} - \text{Rs. 75.79} = \text{Rs. 11.67}$$

Alternative Approach (Under Risk Neutral Model)

Node N₂

VALUE ON EXPIRY [Max(S-E,0)]	PROB	PRODUCT
4.60	0.221	1.02
18.64	0.779	14.52
Expected Value on Maturity		15.54

Value of C₀

[Expected value on Maturity / 1.05127]

14.78

Node N₃

VALUE ON EXPIRY	PROB	PRODUCT
0.00	0.221	0.00
4.60	0.779	3.58
Expected Value on Maturity		3.58

Value of C₀

[Expected value on Maturity / 1.05127]

3.41

Node N₁

VALUE ON EXPIRY	PROB	PRODUCT
3.41	0.221	0.75
14.78	0.779	11.51
Expected Value on Maturity		12.27

Value of C₀

[Expected value on Maturity / 1.05127]

11.67

Question 1(c) [4 Marks]:

On Tuesday morning (before opening of the capital market) an investor, while going through his bank statement, has observed that an amount of Rs. 7 Lakhs is lying in his bank account. This amount is available for use from Tuesday till Friday. The Bank requires a minimum balance of Rs. 1000 all the time. The investor desires to make a maximum possible investment where Value at Risk (VaR) should not exceed the balance lying in his bank account. The standard deviation of market price of the security is 1.5 per cent per day. The required confidence level is 99 per cent.

Given:

Standard Normal Probabilities										
Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9998	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9923	0.9925	0.9929	0.9931	0.9932	0.9934	0.9936

You are required to determine the maximum possible investment.

Solution

'Value at Risk (VaR) refers to the maximum possible loss over a given period of time.

Value at Risk = $\sigma\sqrt{n} \times Z \text{ Score} \times \text{Value of Investment}$

In this case,

Value at Risk = Rs. 7,00,000 (-) Minimum Balance of Rs. 1,000 = **Rs. 6,99,000**

(Note: The problem states that 'VaR should not exceed the balance lying in the bank account'. Since a minimum balance of Rs. 1,000 must always be maintained, the maximum loss that the investor can afford is Rs. 6,99,000).

σ = Daily Standard Deviation = 1.5% or 0.015

n = Number of days of investment = 4 days (Tuesday till Friday)

Z Score = 2.33 (at 99% confidence level)

Value of Investment = ?

So,

Rs. 6,99,000 = 0.015 X $\sqrt{4}$ X 2.33 X Value of Investment

That is,
Rs. 6,99,000 = 0.0699 X Value of Investment

$$\text{So, Value of Investment} = \frac{\text{Rs. } 6,99,000}{0.0699} = \text{Rs. } 1,00,00,000$$

Hence, the maximum possible investment is Rs. 1,00,00,000.

Question 2(a) [8 Marks]:

AB Industries has Equity Capital of Rs. 12 Lakhs, total debt of Rs. 8 Lakhs, and annual sales of Rs. 30 Lakhs. Two mutually exclusive proposals are under consideration for the next year. The details of the proposal are as under:

	Proposal No. 1	Proposal No. 2
Target Assets to Sales Ratio	0.65	0.62
Target Net Profit Margin (%)	4	5
Target Debt Equity Ratio	2:3	4:1
Target Retention Ratio (of Earnings) [%]	75	-
Annual Dividend (Rs. in Lakhs)	-	0.30
New Equity raised (Rs. in Lakhs)	-	1

You are required to calculate sustainable growth rate for both the proposals.

Solution

Sustainable Growth Rate or Corporate Growth Rate is denoted by 'g'.

$$g = br$$

Where,

b = Retention Ratio

r = Return on Equity

Step 1: Calculation of Return on Equity (ROE)

According to Du Pont Model,

$$\text{ROE} = \text{Profitability} \times \text{Efficiency} \times \text{Risk}$$

Or

$$\text{ROE} = \text{Net Profit Margin} \times \text{Asset Turnover Ratio} \times \text{Equity Multiplier}$$

Or

$$\text{ROE} = \frac{\text{Profits After Tax}}{\text{Net Sales}} \times \frac{\text{Net Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Equity}}$$

In this case,

Net Profit Margin is given as 4% and 5% for Proposals 1 and 2 respectively

Problem gives 'Total Assets to Sales Ratio' as 0.65 and 0.62. The requirement is '**Sales to Assets Ratio**'. Hence, inverse of the given ratio must be considered.

Total Liabilities = Total Assets. Problem has given Debt Equity Ratio. The sum of 'Debt and Equity' represents total assets.

In case of Proposal 1, the Debt-Equity Ratio is 2:3. Total Capital employed is 2+3 = 5. Hence, Total Assets are 5. Therefore, '**Total Assets / Equity**' = 5/3

Similarly, in case of Proposal 2, the Debt-Equity Ratio is 4:1. Total Capital employed is 4+1 = 5. Hence, Total Assets are 5. Therefore, 'Total Assets / Equity' = 5/1

$$\text{ROE in case of Proposal 1} = 4\% \times \frac{1}{0.65} \times \frac{5}{3} = 10.26\%$$

$$\text{ROE in case of Proposal 2} = 5\% \times \frac{1}{0.62} \times \frac{5}{1} = 40.32\%$$

Step 2: Calculation of Retention Ratio (b)

In case of Proposal 1: Retention Ratio(b) is given as **75%**

In Case of Proposal 2:

Return on Equity is 40.32%

Equity (i.e., Shareholders' Funds) = Rs. 13 Lakhs [Existing Rs. 12 Lakhs + New Equity Rs. 1 Lakh]

Equity X Return on Equity = Profits After Tax

That is, Profits After Tax = Rs. 13 Lakhs X 40.32% = Rs. 5.2416 Lakhs

Dividend paid is given as Rs. 0.30 Lakhs

So, Retained Earnings = Rs. 5.2416 Lakhs (-) Rs. 0.30 Lakhs = Rs. 4.9216 Lakhs

Hence, Retention Ratio is $\frac{\text{Rs. 4.9216 Lakhs}}{\text{Rs. 5.2416 Lakhs}} \times 100 = 93.89\%$

Step 3: Calculation of Growth Rate (g)

$$g = br$$

In Case of Proposal 1:

$$g = 75\% \times 10.26\% = 7.695\%$$

In Case of Proposal 2:

$$g = 93.89\% \times 40.32\% = 37.856\%$$

Note: In the Second proposal, if Equity is considered as only Rs. 1 Lakh instead of Rs. 13 Lakh, the above answers will differ.

Question 2(b) [8 Marks]:

IB an Indian firm has its subsidiary in Japan and Zaki is a Japanese firm having its subsidiary in India, and face the following interest rates:

	IB	Zaki
INR floating rate	BPLR + 0.50%	BPLR + 2.50%
JPY (Fixed Rate)	2%	2.25%

Zaki wishes to borrow Rupee Loan at floating rate and IB wishes to borrow JPY at fixed rate. The amount of loan required by both the companies is same at the current Exchange Rate. A financial institution may arrange a swap and requires 25 basis points as its commission. Gain, if any, is to be shared by the firms equally.

You are required to find out:

- (i) Whether a swap can be arranged which may be beneficial to both the firms?
- (ii) What rate of the interest will the firms end up paying?

Solution

Step One: Identification of Stronger Party

Strong Party: IB

Step Two: Checking the Possibility of entering into SWAP arrangement

Floating Rate Differential: 2.00%
Fixed Rate Differential: 0.25%

Since the Strong party has high advantage for Floating Rate Loan (i.e., INR Loan), the Swap can be entered if-

IB is having Floating Rate Loan (i.e., INR Loan) but wants Fixed Rate Loan (i.e., JPY Loan), and
Zaki is having Fixed Rate Loan (i.e., JPY Loan) but wants Floating Rate Loan (i.e., INR Loan).

The requirement in this case is matching with the Condition. Hence, a Swap arrangement can be entered.

Step Three: Sharing of Gain

Net Interest Differential: $1.50\% - 0.25\% = 1.75\%$
Share of intermediary: 0.25%
Share of A: 0.75%
Share of B: 0.75%

Step Four: Operations and Settlement:

IB	%	Zaki	%
Payment of Interest on existing loan	(BPLR + 0.50)	Payment of Interest on existing loan	(2.25)
Receipt from Zaki	BPLR + 1.25	Payment to IB	(BPLR + 1.25)
Payment to Zaki	(2.00)	Receipt from IB	2.00
		Payment to Intermediary	(0.25)
	(1.25)		(BPLR + 1.75)

Note:

Zaki pays IB 'the amount of interest paid by IB plus its share of gain'.

IB pays Zaki 'the rate of interest it would have paid if it had directly borrowed fixed rate loan in JPY'

Question 2(c) [4 Marks]:

Peer-to-peer Lending and Crowd funding are same and traditional methods of funding. Do you agree? Justify your stand.

Answer

In case of peer-to-peer lending, group of people come together and lend money to each other. Peer to peer lending has been there for many years. Many small and ethnic business groups having similar faith or interest generally support each other in their start up endeavours.

Crowdfunding is the use of small amounts of capital from a large number of individuals to finance a new business initiative. Crowdfunding makes use of the easy accessibility of vast networks of people through social media and crowdfunding websites to bring investors and entrepreneurs together.

Question 3(a) [7 Marks]:

The following data are available for a bond:

Face Value Rs. 10,000 to be redeemed at par on maturity.

Coupon rate 8.5 per cent per annum.

Years to Maturity: 5 years

Yield to Maturity (YTM) 10 per cent

You are required to calculate:

- (i) Current market price of the Bond,
- (ii) Macaulay's Duration,
- (iii) Volatility of the Bond,
- (iv) Convexity of the Bond,
- (v) Expected market price, if there is a decrease in the YTM by 200 basis points
 - (a) By Macaulay's Duration based estimate
 - (b) By Intrinsic Value Method.

Given:

Years	1	2	3	4	5
PVIF (10%,n)	0.909	0.826	0.751	0.683	0.621
PVIF (8%,n)	0.926	0.857	0.794	0.735	0.681

Solution

Year	Cash Inflows	PV of Re. 1 @ 10%	PV of Cash Inflows	Weight	Weight X Time	$\frac{(t^2+t) \text{ Cash Flow}}{(1+y)^t}$
1	850	0.909	772.65	0.082	0.082	1545.30
2	850	0.826	702.1	0.074	0.149	4212.60
3	850	0.751	638.35	0.068	0.203	7660.20
4	850	0.683	580.55	0.062	0.246	11611.00
5	10850	0.621	6737.85	0.714	3.572	202135.50
			9431.50		4.252	227164.60
			P ₀		Duration	

- (i) Current Market Price of the Bond = Present Value of Future Cash Flows = **Rs. 9431.50**

(ii) Duration of the Bond = **4.252 Years**

(iii) Volatility of the Bond (i.e., Modified Duration) = $\frac{Duration}{(1+y)} = \frac{4.252}{(1+0.10)} = \mathbf{3.866}$

(iv) Convexity of the Bond = $\frac{\sum \left[\frac{(t^2+t) \text{ Cash Flow}}{(1+y)^t} \right]}{P(1+y)^2} = \frac{227164.60}{9431.50(1.1)^2} = \frac{227164.60}{11412.12} = \mathbf{19.905}$

(v) Expected market price, if there is a decrease in the YTM by 200 basis points

(a) Macaulay's Method

% Change in Bond Price = (- Modified Duration X % Change in interest rates) + (0.5 X Convexity X % Change in Interest rates²)

$$\begin{aligned} &= (-3.866 \times -2\%) + (0.5 \times 19.905 \times -2\%^2) \\ &= 0.07732 + 0.00398 \\ &= 0.0813 = \mathbf{8.13\%} \end{aligned}$$

So, Value of Bond = Rs. 9431.50 + (8.13% X Rs. 9431.50) = **Rs. 10198.28**

(b) Intrinsic Value Method

Year	Cash Inflows	PV of Re. 1 @ 8%	PV of Cash Inflows
1	850	0.926	787.1
2	850	0.857	728.45
3	850	0.794	674.9
4	850	0.735	624.75
5	10850	0.681	7388.85
			10204.05

When PV of Re. 1 is not restricted to 3 digits

Year	Cash Inflows	PV of Re. 1 @ 8%	PV of Cash Inflows
1	850	0.925926	787.037
2	850	0.857339	728.738
3	850	0.793832	674.7574
4	850	0.735030	624.7754
5	10850	0.680583	7384.328
			10199.64

Question 3(b) [10 Marks]:

M/s Corpus an AMC, on 01.04.2015 has floated two schemes viz., Dividend Plan and Bonus Plan. Mr. X, an investor has invested in both the schemes. The following details (except the issue price) are available:

Date	Dividend (%)	Bonus Ratio	Net Asset Value (Rs.)	
			Dividend Plan	Bonus Plan
01.04.2015			?	?
31.12.2016		1:4	47	40
31.03.2017	12		48	42
31.03.2018	10		50	39
31.12.2018		1:5	46	43
31.03.2019	15		45	42
31.03.2020	-	-	49	44
Additional Details				
Investment	Rs. 9,20,000	Rs. 10,00,000		
Average Profit	Rs. 27,748.60			
Average Yield		6.40%		

You are required to calculate the issue price of both the schemes as on 01.04.2015.

Solution

Assumption: It is assumed that the Face Value per unit is Rs. 10

In Case of Dividend Plan

Investment made: Rs 9,20,000

Average Profit i.e., Profit per annum = Rs. 27,748.60

Holding Period = 01.04.2015 to 31.03.2020 = 5 years

Total Profits = Rs. 27,748.60 X 5 = **Rs. 1,38,743**

So, Value of Units held at the time of sale on 31.03.2020 = Rs. 9,20,000 + Rs. 1,38,743
= **Rs. 10,58,743**

NAV per unit at the time of sale on 31.03.2020 = Rs. 49

Therefore, **number of units sold** = $\frac{\text{Rs. } 10,58,743}{\text{Rs. } 49} = \mathbf{21607}$

On 31.03.2019

on 31.03.2019, Dividend @ 15% was declared. That is, Dividend per unit of Rs. 1.50 (15% of Rs. 10) was declared in lieu of which additional units were issued.

Let Number of units under the plan on 31.03.2019 before declaration of dividend be 'x'.

Then, Dividends were 1.50x

NAV per unit on 31.03.2019 was Rs. 45

Number of additional units issued on 31.03.2019 were $\frac{1.50x}{\text{Rs. } 45}$

So, $x + \frac{1.50x}{\text{Rs. } 45} = 21607$

That is, $\frac{45x}{45} + \frac{1.50x}{45} = 21607 = \frac{46.50x}{45} = 21607$

Therefore, $x = \frac{21607 \times 45}{46.5} = \mathbf{20910 \text{ Units}}$

So, Number of units under the scheme on 31.03.2019 (before issue of additional units) were 20910.

On 31.03.2018

on 31.03.2018, Dividend @ 10% was declared. That is, Dividend per unit of Re. 1.00 (10% of Rs. 10) was declared in lieu of which additional units were issued.

Let Number of units under the plan on 31.03.2018 before declaration of dividend be 'x'.

Then, Dividends were 1.00x

NAV per unit on 31.03.2018 was Rs. 50

Number of additional units issued on 31.03.2018 were $\frac{1.00x}{\text{Rs. } 50}$

$$\text{So, } x + \frac{1.00x}{\text{Rs. } 50} = 20910$$

$$\text{That is, } \frac{50x}{50} + \frac{1.00x}{50} = 20910 = \frac{51x}{50} = 20910$$

$$\text{Therefore, } x = \frac{20910 \times 50}{51} = \mathbf{20500 \text{ Units}}$$

So, Number of units under the scheme on 31.03.2018 (before issue of additional units) were 20500.

On 31.03.2017

on 31.03.2017, Dividend @ 12% was declared. That is, Dividend per unit of Re. 1.20 (12% of Rs. 10) was declared in lieu of which additional units were issued.

Let Number of units under the plan on 31.03.2017 before declaration of dividend be 'x'.

Then, Dividends were 1.20x

NAV per unit on 31.03.2017 was Rs. 48

Number of additional units issued on 31.03.2017 were $\frac{1.20x}{\text{Rs. } 48}$

$$\text{So, } x + \frac{1.20x}{\text{Rs. } 48} = 20500$$

$$\text{That is, } \frac{48x}{48} + \frac{1.20x}{48} = 20500 = \frac{49.20x}{48} = 20500$$

$$\text{Therefore, } x = \frac{20500 \times 48}{49.20} = \mathbf{20000 \text{ Units}}$$

So, Number of units under the scheme on 31.03.2017 (before issue of additional units) were 20000.

Calculation of Issue Price on 01.04.2015

Date of issue of units under the Scheme was 01.04.2015.

From 01.04.2015 till 31.03.2017 there was no declaration of dividends and consequently there was no issue of additional units.

Hence, on 01.04.2015 **the number of units subscribed for was 20000.**

Investment made was Rs. 9,20,000.
Therefore, Issue price under Dividend Plan was:

$$\frac{\text{Rs. } 9,20,000}{20,000 \text{ Units}} = \text{Rs. } 46$$

In Case of Bonus Plan

Average Yield (i.e., Annualised Yield) under the plan on 31.03.2020 was 6.40%

In case of Bonus Plan, Annualised Yield is calculated using the following formula:

$$\text{Annualised Yield} = \frac{\text{Value}_1 - \text{Value}_0}{\text{Value}_0} \times 100 \times \frac{12 \text{ Months}}{N}$$

In this case,

Annualised Yield = 6.40%

Value₀ (i.e., Investment made) = Rs. 10,00,000

N (Holding Period) = 01.04.2015 till 31.03.2020 = 5 years or 60 Months

Value₁ (i.e., Value of investment on the date of sale) = ?

So,

$$6.40 = \frac{\text{Value}_1 - \text{Rs. } 10,00,000}{\text{Rs. } 10,00,000} \times 100 \times \frac{12 \text{ Months}}{60 \text{ Months}}$$

Therefore,

$$\text{Value}_1 = \left(6.40 \times \frac{60}{12} \times \frac{1}{100} \times \text{Rs. } 10,00,000 \right) + \text{Rs. } 10,00,000 = \text{Rs. } 13,20,000$$

So, On 31.03.2020, the Value of units sold is Rs. 13,20,000

NAV per unit on the date of sale under the plan was Rs. 44.

$$\text{Hence, Number of units sold on 31.03.2020} = \frac{\text{Rs. } 13,20,000}{\text{Rs. } 44} = 30000.$$

On 31.12.2018

On 31.12.2018, Bonus issue was made in the ratio of 1:5.

That is, for every 5 units held, 1 unit was issued as Bonus.

Let number of units held under the plan before issue of Bonus units be x.

Then, the Number of units issued as Bonus = $\frac{1}{5}x = 0.20x$

So, Total Units under the plan after Bonus Issue was $x + 0.20x = 1.20x$

The number of units sold on 31.03.2020 was 30,000.

Hence, $1.20x = 30,000$ units

$$\text{Therefore, } x = \frac{30000 \text{ units}}{1.20} = 25000 \text{ Units}$$

So, before issue of bonus units on 31.12.2018, the number of units held was **25000**

On 31.12.2016

On 31.12.2016, Bonus issue was made in the ratio of 1:4.
That is, for every 4 units held, 1 unit was issued as Bonus.

Let number of units held under the plan before issue of Bonus units be x .

Then, the Number of units issued as Bonus = $\frac{1}{4}x = 0.25x$

So, Total Units under the plan after Bonus Issue was $x + 0.25x = 1.25x$

The number of units held on 31.12.2016 before bonus issue was 25,000.

Hence, $1.25x = 25,000$ units

Therefore, $x = \frac{25000 \text{ units}}{1.25} = 20000 \text{ Units}$

So, before issue of bonus units on 31.12.2016, the number of units held was **25000**

Calculation of Issue Price on 01.04.2015

Date of issue of units under the Scheme was 01.04.2015.

From 01.04.2015 till 31.12.2016 there was no bonus issue and consequently there was no issue of additional units.

Hence, on 01.04.2015 **the number of units subscribed for was 20000.**

Investment made was Rs. 10,00,000.

Therefore, Issue price under Bonus Plan was:

$$\frac{\text{Rs. } 10,00,000}{20,000 \text{ Units}} = \text{Rs. } 50$$

Question 3(c) [3 Marks]:

An individual attempts to found and build a company from personal finances and from the operating revenues of the new company. What this method is called? Discuss any two methods.

Answer

An individual is said to be **bootstrapping** when he or she attempts to found and build a company from personal finances or operating revenues of the new company.

Methods in which a start-up firm can boot-strap includes-

- (a) Trade Credit,
- (b) Factoring, and
- (c) Leasing.

Trade Credit is the credit extended by the supplier of material and services. Usually, start-ups may not be able to get credit from suppliers. However, companies having sound financial plan and clear vision are always supported by the suppliers.

Factoring is a financing method where accounts receivable of a business organisation are sold to a commercial finance company for raising capital.

Leasing is another popular method of boot-strapping. Under this arrangement, a business entity acquires an asset on lease than purchasing it. This results in reduced capital, lower capital cost and tax benefit to the business entity (i.e., the lessee).

Question 4(a) [12 Marks]:

ICL is proposing to take over SVL with an objective to diversify. ICL's profit after tax (PAT) has grown @ 18 per cent per annum and SVL's PAT is grown @ 15 per cent per annum. Both the companies pay dividend regularly. The summarised Profit & Loss Account of both the companies are as follows:

Rs. in Crores		
Particulars	ICL	SVL
Net Sales	4,545	1,500
PBIT	2,980	720
Interest	750	25
Provision for Tax	1,440	445
PAT	790	250
Dividends	235	125
Undistributed Profits	555	125

The Balance Sheet of both the companies are as follows:

Rs. in Crores				
		ICL		SVL
Fixed Assets				
Land and Buildings (Net)	720		190	
Plant and Machinery (Net)	900		350	
Furniture and Fixtures (Net)	30	1,650	10	550
Current Assets		775		580
Less: Current Liabilities				
Creditors	230		130	
Overdrafts	35		10	
Provision for Tax	145		50	
Provision for Dividends	60	470	50	240
Net Assets		1,955		890
Paid-up Share Capital (Rs. 10 per share)	250		125	
Reserves and Surplus	1,050	1,300	660	785
Borrowing		655		105
Capital Employed		1,955		890
Market Price per Share		Rs. 52		Rs. 75

ICL's Land & Buildings are stated at current prices. SVL's Land & Buildings are revalued three years ago. There has been an increase of 30 per cent per year in the value of Land & Buildings.

SVL is expected to grow @ 18 per cent each year, after merger.

ICL's Management wants to determine the premium on the shares over the current market price which can be paid on the acquisition of SVL.

You are required to determine the premium using:

- (i) Net Worth adjusted for the current value of Land & Buildings plus the estimated average profit after tax (PAT) for the next five years.
- (ii) The dividend growth formula.
- (iii) ICL will push forward which method during the course of negotiations?

Period (t)	1	2	3	4	5
FVIF(30%,t)	1.300	1.690	2.197	2.856	3.713
FVIT(15%,t)	1.15	2.4725	3.9938	5.7424	7.7537

Solution

Premium on Shares = Value per share to be given (-) Current Market Price per Share.

Current Market Price per Share of SVL is Rs. 75.

The Value per share to be given must be ascertained under two methods specified in the problem.

Method 1: On the basis of Adjusted Net Worth and Estimated Average Profits

The Problem states that value of the share must be based on 'Net Worth adjusted for the current value of Land & Buildings plus the estimated average profit after tax (PAT) for the next five years.'

	Rs. in Crores
Present Net Worth of SVL Ltd., (Equity Share Capital + Reserves & Surplus)	785.00
Additional value of Land and Buildings (See Note 1)	227.43
Average Profits for the next 5 years (See Note 2)	387.69
	1400.12
Number of Equity Shares in SVL Ltd., (Rs. 125 Crores / Rs.10 per share)	12.50 Crores
Value per Share (Rs. 1400.12 Crores / 12.50 Crore Shares)	Rs. 112.00
Premium per Share (Rs. 112.00 – Rs. 75.00)	Rs. 37

Notes:

1. Problem states that value of Land and Buildings has increased by 30 per cent per year after the previous revaluation 3 years ago. Value of Land and Buildings in the Balance Sheet is given as Rs. 190 Crores. This is the value ascertained 3 years ago. So, the Current value of Land and Buildings is-

$$\text{Rs. 190 Lakhs} \times (1+0.30)^3 = \text{Rs. 417.43 Crores}$$

Hence, additional value of Land and Buildings to be considered in Net Worth is:
Rs. 417.43 Crores (-) Rs. 190 Crores = Rs. 227.43 Crores

2. The current (zero period) profits of SVL Ltd., is Rs. 250 Crores.
SVL's PAT has grown by 15% p.a.
Assuming the same growth rate, Estimated Total Profits for the next 5 years will be:
Rs. 250 Crores X FV of Annuity of Re. 1 @ 15% for 5 years
= Rs. 250 Crores X 7.7537 = **Rs. 1938.43 Crores**

Alternatively,

Estimated Profits considering a growth rate of 15% p.a. for the next 5 years will be:

	Rs. in Crores
Year 1: Rs. 250 Crores X 1.15	287.500
Year 2: Rs. 250 Crores X 1.15 ²	330.625
Year 3: Rs. 250 Crores X 1.15 ³	380.219
Year 4: Rs. 250 Crores X 1.15 ⁴	437.252
Year 5: Rs. 250 Crores X 1.15 ⁵	502.839
	1938.435

So, Estimated Average PAT = Rs. 1938.435 / 5 = **Rs. 387.69 Crores**

Method 2: On the basis of Dividend Growth Model:

Value of share under Dividend Growth Model can be ascertained using the following formula:

$$P_0 = \frac{D_1}{K_e - g}$$

The problem does not give any information or hint regarding Cost of Equity (K_e). The information for finding value under Dividend Growth Model is inadequate.

On the basis of the information available and various assumptions, value of the share is calculated as follows:

Present Dividend (D₀) = Current Dividends / Number of Shares
= Rs. 125 Crores / 12.50 Crores = **Rs. 10 per share.**

Growth Rate = **18%** (Post-merger Growth Rate is considered)

Next year Dividend (D₁) = D₀ (1+g) = Rs. 10 (1+0.18) = **Rs. 11.80**

Cost of Equity (K_e) = $\frac{D_1}{P_0} + g$

Calculation of K_e is based on present and past data.

P₀ = Rs. 75

g = 15%

D₁ = Rs.10 (1+0.15) = Rs. 11.50

So, K_e = $\frac{Rs. 11.50}{Rs. 75.00} + 0.15 = 0.3033 = \mathbf{30.33\%}$

So, P₀ = $\frac{Rs. 11.80}{0.3033 - 0.18} = \mathbf{Rs. 95.68}$

Therefore, premium per share = Rs. 95.68 – Rs. 75.00 = **Rs. 20.68**

Inference: The premium per share to be offered is lower under Dividend Growth Model. For Acquiring Company (i.e., ICL), it will be advantageous to push for Dividend Growth Model during negotiations.

Question 4(b) [4 Marks]:

USD 10,000 is lying idle in your Bank Account. You are able to get the following quotes from the dealers:

Dealer	Quote
A	EUR/USD 1.1539
B	EUR/GBP 0.9094
C	GBP/USD 1.2752

Is there an opportunity of gain from these quotes?

Solution

The value of Euro is higher than USD and the value of a Sterling Pound is higher than Euro. Hence, the quotations given must be read as-
USD per Euro = 1.1539
GBP per Euro = 0.9094
USD per GBP = 1.2752

There is scope for cross currency arbitrage, when Direct Quotation for a currency 'is not equal to' Cross Currency Quotation.

In this case,

USD/Euro = 1.1539 (Direct Quote)

USD/Euro = (USD/GBP) X (GBP/Euro) = 1.2752 X 0.9094 = 1.1597 (Cross Currency Quote)

Since the Direct Quote $\neq$ Cross Currency Quote, there is scope for arbitrage.

Proof:

Available funds: 10000 USD.

Convert 10000USD into Euros and receive: $10000 / 1.1539 = 8666.26$ Euros

Convert 8666.26 Euros into GBP and receive: $8666.26 \times 0.9094 = 7881.10$ GBP

Convert 7881.10 GBP into USD and receive: $7881.10 \text{ GBP} \times 1.2752 = 10049.98 \text{ USD}$

Gain: Rs. 49.98 USD for every 10000 USD

Question 4(c) [4 Marks]:

Side Pocketing enhances the value of the Mutual Fund. Do you agree? Briefly explain the process of side pocketing.

Answer

Side-pocketing in Mutual Funds leads to separation of risky assets from other investments and cash holdings. The purpose of side-pocketing is to ensure that the money invested in mutual funds, which is linked to stressed assets, gets locked, until the fund recovers the money from the company or could avoid distress selling of illiquid securities.

Following is the modus operandi of side-pocketing:

Whenever, the rating of the mutual fund decreases, the fund shifts the illiquid assets into a side pocket so that current shareholders can be benefited from the liquid assets. Consequently, the NAV of the Fund will reflect the actual value of liquid assets.

Side pocketing is beneficial for those investors who wish to hold on the units of the Fund for long-term. Thereby, the process of side-pocketing ensures that liquidity is not the problem even in the circumstances of frequent allotments and redemptions.

Side-pocketing is quite common internationally. However, it has also been resorted to bereft the investors of genuine returns.

Question 5(a) [8 Marks]:

ICL and Indian MNC is executing a plant in Sri Lanka. It has raised Rs. 400 billion. Half of the amount will be required after six months' time. ICL is looking an opportunity to invest this amount on 1st April 2020 for a period of six months. It is considering two underlying proposals:

Market	Japan	US
Nature of Investment	Index Fund (JPY)	Treasury Bills (USD)
Dividend (in billions)	25	-
Income from stock lending (in billions)	11.9276	-
Discount on initial investment at the end	2%	-
Interest	-	5 per cent per annum
Exchange Rate (1 st April 2020)	JPY/INR 1.58	USD/INR 0.014
Exchange Rate (30 th September 2020)	JPY/INR 1.57	USD/INR 0.013

You, as an Investment Manager, is required to suggest the best course of option.

Solution

Amount available for investment is Rs. 200 Billion (i.e., Half of Rs. 400 Billion).

Option A:

On 1st April 2020, Convert 200 Billion INR into Japanese Yen at the Spot Rate of 1.58JPY per INR and receive **316 Billion JPY**.

Invest 316 Billion JPY in Securities.

On 30th September, Realise-

	In Million JPY
Dividends	25.0000
Earnings from Stock borrow-lend activity	11.9276
Consideration on sale of Securities (316 Billion X 98%)	309.6800
	346.6076

Convert 346.6076 JPY into INR on 30th September @ 1.57 JPY per INR.

INR receivable on conversion = 346.6076 Billion / 1.57 = **220.7692 Billion INR**.

Option B:

Convert INR 200 Billion into US Dollars at the Spot Rate of 0.014 USD per INR and receive 2.8 Billion USD.

Invest 2.8 Billion USD in risk-free securities for 6 months @ 5% p.a.

On 30th September, realise-

2.8 Billion USD + (2.8 Billion USD X 5% X 6/12) = 2.87 Billion USD.

Convert 2.87 Billion USD into INR @ 0.013 USD per INR.

INR receivable on conversion = 2.87 Billion / 0.013 = **220.7692 Billion INR**

The amount realisable in both cases is same. It is advisable to consider **Option B** which fetches same amount with no risk.

Question 5(b) [8 Marks]:

The following are the details of three mutual funds of MFL:

	Growth Fund	Balanced Fund	Regular Fund	Market
Average Return (%)	7	6	5	9
Variance	92.16	54.76	40.96	57.76
Coefficient of Determination	0.3025	0.6561	0.9604	

The Yield on 182 days Treasury Bill is 9 per cent per annum.

You are required to:

- Rank the funds as per Sharpe's measure.
- Rank the funds as per Treynor's measure.
- Compare the performance with the market.

Solution

- (i) Ranking on the basis of Sharpe's Measure

$$\text{Sharpe's Measure: } \frac{R_p - R_f}{\sigma_p}$$

Fund	Average Annual Return	Standard Deviation ($\sqrt{\text{Variance}}$)	Sharpe's Measure
Growth Fund	7	9.6	-0.2083
Balanced Fund	6	7.4	-0.4054
Regular Fund	5	6.4	-0.6250
Market	9	7.6	0

Since all the funds are having a negative value, ranking cannot be given.

- (ii) Ranking on the basis of Treynor's Measure

$$\text{Treynor's Measure: } \frac{R_p - R_f}{\beta_p}$$

Calculation of Beta

Co-efficient of Determination (i.e., r^2) is given in the problem. This is the measure of systematic risk.

$$r^2 = \frac{\beta^2 \sigma_m^2}{\sigma_i^2}$$

$$\text{So, } \beta = \sqrt{\frac{r^2 \sigma_i^2}{\sigma_m^2}}$$

In case of Growth Fund:

$$\beta = \sqrt{\frac{0.3025 \times 92.16}{57.76}} = 0.6947$$

In case of Balanced Fund:

$$\beta = \sqrt{\frac{0.6561 \times 54.76}{57.76}} = 0.7887$$

In case of Regular Fund:

$$\beta = \sqrt{\frac{0.9604 \times 40.96}{57.76}} = 0.8253$$

In case of Market:

In case of Balanced Fund:

$$\beta = 1$$

Calculation of Treynor's Measure

Fund	Average Annual Return	Beta	Treynor's Measure
Growth Fund	7	0.6947	-2.8789
Balanced Fund	6	0.7887	-3.8037
Regular Fund	5	0.8253	-4.8467
Market	9	1.0000	0

Since all the funds are having a negative value, ranking cannot be given.

(iii) Comparison of performance with the market

The performance of all the funds is below the performance of the market. That is, the market is performing better than any individual fund in the market.

Question 5(c) [4 Marks]:

In an efficient market, technical analysis may not work perfectly. However, with imperfections, inefficiencies and irrationalities, which characterizes the real world, technical analysis may be helpful.

Critically analyse the statement.

Answer

Technical Analysis is the art of science of presenting stock related data on charts, detecting various patterns and indicators, and thereby assessing the market direction (i.e., the trend).

Technical Analysis have several supports as well as critics. The advocates of technical analysis offer the following interrelated argument in their favour:

- (a) Under influence of crowd psychology trend persist for sometime. Tools of technical analysis helps in identifying these trends early and help in investment decision making.
- (b) Shift in demand and supply are gradual rather than instantaneous. Technical analysis helps in detecting this shift rather early and hence provide clues to future price movements.
- (c) Fundamental information about a company is observed and assimilated by the market over a period of time. Hence price movement tends to continue more or less in the same direction till the information is fully assimilated in the stock price.

Detractors of Technical Analysis believe that it is an useless exercise. Their arguments are as follows:

- (a) Most technical analysts are not able to offer a convincing explanation for the tools employed by them.
- (b) Empirical evidence in support of random walk hypothesis cast its shadow over the usefulness of technical analysis.
- (c) By the time an up-trend and down-trend may have been signaled by technical analysts, it may already have taken place.
- (d) Ultimately technical analysis is self-defeating proposition. With more and more people employing it, the value of such analysis tends to decline.

In a nutshell, it can be concluded that in a rational, well ordered and efficient market, technical analysis may not work very well. However, with imperfection, inefficiency and irrationalities that characterises the real-world market, technical analysis may be helpful. If technical analysis is used in conjunction with fundamental analysis, it might be useful in providing proper guidance to investment decision makers.

Question 6(a) [8 Marks]:

An investor is considering to purchase the equity shares of LX Ltd., whose current market price (CMP) is Rs. 112. The company is proposing a dividend of Rs. 4 for the next year. LX Ltd., is expected to grow @ 20 per cent per annum for the next four years. The growth will decline linearly to 16 per cent per annum after the first four years. Thereafter, it will stabilize at 16 per cent per annum infinitely. The investor requires a return of 20 per cent per annum. You are required

- (i) To calculate the intrinsic value of the share of LX Ltd.
(ii) Whether it is worth to purchase the share at this price.

Period	1	2	3	4	5	6	7
PVIF (20%,n)	0.833	0.694	0.579	0.482	0.402	0.335	0.279

Solution

Question (i):

YEAR	Growth Rate	Dividends	PV of Re.1 @ 20%	PV of Dividends
1	20%	4.000	0.833	3.332
2	20%	4.800	0.694	3.331
3	20%	5.760	0.579	3.335
4	20%	6.912	0.482	3.332
5	19%	8.225	0.402	3.307
6	18%	9.706	0.335	3.251
7	17%	11.356	0.279	3.168
				23.056
<u>Add: Continuing Value</u>				-
[(Rs. 11.356 X 1.16) / (0.20-0.16)] X 0.279				<u>91.880</u>
Value of the Share				114.94

Question (ii):

The intrinsic value of the share is Rs. 114.94. However, the current market price is Rs. 112. The stock is under-priced in the market. Hence, it is worth to purchase the stock at this price.

Question 6(b) [8 Marks]:

The Management of a multinational company TL Ltd., is engaged in construction of infrastructure project. A proposal to construct a Toll Road in Nepal is under consideration of the Management.

The following information is available-

The initial investment will be in purchase of equipment costing USD 250 Lakhs. The economic life of the equipment is 10 years. The depreciation on the equipment will be charged on straight line method. EBITDA to be collected from the Toll Road is projected to be USD 33 Lakhs per annum for a period of 20 years.

To encourage investment Nepalese government is offering a 15-year term loan of USD 150 Lakhs at an interest rate of 6 per cent per annum. The interest is to be paid annually. The loan will be repaid at the end of 15 years in one tranche.

The required rate of return for the project under all equity financing is 12 per cent per annum.
Post-tax cost of debt is 5.6 per cent per annum.

Corporate Tax rate is 30 per cent.

All Cash Flows will be in USD.

Ignore inflation.

You are required to advise the management on the viability of the proposal by using Adjusted Net Present Value Method.

Given

PVIFA (12%,10) = 5.650, PVIFA (12%, 20) = 7.469, PVIFA (8%, 15) = 8.559, PVIF (8%,15) = 0.315

Solution

APV (Adjusted Present Value) = Base Case NPV + Benefit on account of leverage – Issue costs

That is,

APV = [PV of Cash Inflows @ K_e – Cash Outflows] + [PV of Tax Savings on account of interest on borrowings calculated at pre-tax cost of debt] – Issue Costs.

Base-case NPV

Cash Outflows = 250 Lakh USD

Depreciation p.a. (under Straight Line Method) = $\frac{\text{Cost of the Equipment} - \text{Salvage}}{\text{Useful Life}} = \frac{250 \text{ Lakh USD} - \text{Nil}}{10 \text{ Years}} = \text{Rs. 25 Lakhs}$

Useful Life of the Equipment is only 10 years. Hence, in calculation of cash inflows, depreciation benefit must be considered only for first 10 years.

Cost of Equity is 12%

PV of Annuity of Re. 1 @ 12% for 10 years = 5.650 (given)

PV of Annuity of Re. 1 @ 12% from years 11 to 20 = 7.469 – 5.650 = 1.819

Cash Inflows:

	USD in Lakhs	
	Years 1 to 10	Years 11 to 20
EBITDA	33.00	33.00
Less: Depreciation p.a.	<u>25.00</u>	<u>0</u>
	8.00	33.00
Less: Tax @ 30%	<u>2.40</u>	<u>9.90</u>
	5.60	23.10
Add: Depreciation p.a.	<u>25.00</u>	<u>0</u>
Cash Inflow p.a.	30.60	23.10
PV of Annuity of Re.1 @ 12%	5.650	1.819
PV of Cash Inflows	172.89	42.02

Base Case NPV = (USD 172.89 Lakhs + USD. 42.02 Lakhs) – USD 250 Lakhs
= **(-) USD 35.09 Lakhs**

Benefit on account of leverage

Loan Amount: USD 150 Lakhs

Rate of Interest: 6% per annum

Tax Rate: 30%

Tax Savings p.a. on account of interest on loan: 150 Lakhs X 6% X 30% = 2.70 Lakh USD

Period of Loan = 15 years

Benefit on account of leverage = PV of Tax Savings on account of interest on borrowings calculated at **pre-tax cost of debt**

Post-tax cost of debt is given as 5.6%

Tax Rate is 30%

Hence, Pre-tax cost of debt = $\frac{\text{Post-tax cost of debt}}{(1 - \text{Tax Rate})} = \frac{5.6\%}{(1 - 0.3)} = 8\%$

PV of Annuity of Re. 1 @ 8% for 15 years = 8.559

So, PV of tax benefit on account of interest on loan = Rs. 2.70 Lakhs X 8.559
= **USD 23.10 Lakhs**

Adjusted Present Value:

APV = Base Case NPV + Benefit on account of leverage – Issue costs

So, APV = USD (-) 35.09 Lakhs + USD 21.10 Lakhs (-) Nil

Hence, **APV = USD (-) 11.99 Lakhs**

Advice: It is not advisable for TL Ltd., to invest in the project, since it results in a loss of USD 11.99 Lakhs. That is, the project is **not a viable investment option**.

Question 6(c) [4 Marks]:

Distinguish between Pass Through Certificates (PTC) and Pay Through Securities (PTS).

Answer

On the basis of different maturity characteristics, Securitized instruments can be divided into three categories viz., Pass Through Certificates (PTC), Pay Through Securities (PTS) and Stripped Securities.

Pass Through Certificates (PTC) are the instruments that facilitate transfer of the entire cash receipts from asset sold, in the form of interest or principal. Thus, these securities represent direct claim of the investors on all the assets that has been securitised through Special Purpose Vehicle.

In a **Pay Through Securities (PTS)**, the debt securities of the Special Purpose Vehicle are backed by assets and it can restructure different tranches from varying maturities of receivables. In other words, this structure permits desynchronization of servicing of securities from cash flows generated on the asset.

Question 6(c) [4 Marks] – Choice Question:

Differentiate between Economic Value Added (EVA) and Market Value Added (MVA)

Answer

‘Economic Value Added (EVA)’ refers to the excess profits earned by the Company over and above shareholders’ expectations. It is measured with the help of the following formula:

$$\text{EVA} = \text{Net Operating Profits after Taxes} - (\text{Weighted Average Cost of Capital} \times \text{Capital Employed})$$

The Concept of EVA helps in identifying whether a company is ‘creating value’ or ‘eroding value.’

Market Value Added (MVA) refers to ‘Present Value of Future EVA’. It indicates the value added by the company to the ‘present capital employed.’ MVA helps in identifying the ‘value’ or ‘worth’ of the business entity.

MVA can also be measured by calculating the excess of Market Value (i.e., Market Capitalisation) of the Company over and above its ‘Actual Capital Employed.’

Both EVA and MVA indicate the ‘value created’ by the company. However, EVA is based on internal information, whereas MVA is based on external information i.e., market value.