

**CA FINAL (NEW SCHEME)
STRATEGIC FINANCIAL MANAGEMENT
DECEMBER 2021 EXAM PAPER – SUGGESTED ANSWERS**

Question 1(a) [8 Marks]:

M/s KPMS Ltd., wants to purchase M/s BRB Ltd., by exchanging 0.7 of its share for each share of M/s BRB Ltd. Relevant financial data are as follows:

	M/s KPMS Ltd.,	M/s BRB Ltd.,
Equity Shares outstanding	20,00,000	8,00,000
EPS (Rs.)	40	28
Market price per share (Rs.)	250	160

- (i) Illustrate the impact of merger on EPS of both the companies.
- (ii) The management of M/s BRB Ltd., has quoted a share exchange ratio of 1:1 for the merger. Assuming that P/E ratio of M/s KPMS Ltd., will remain unchanged after the merger, what will be the gain from merger for M/s BRB Ltd.?
- (iii) Find out the gain / loss to shareholders of M/s KPMS Ltd., if the exchange ratio is 1:1?
- (iv) Determine the maximum exchange ratio acceptable to shareholders of M/s Ltd.?

Solution

	M/s KPMS Ltd.,	M/s BRB Ltd.,
Equity Shares outstanding	20,00,000	8,00,000
EPS (Rs.)	40	28
Market price per share (Rs.)	250	160
Earnings after Tax (N X EPS) – Rs.	800 Lakhs	224 Lakhs
PE Ratio [Market Price per Share / EPS]	6.25	5.71

- (i) Impact on EPS for shareholders of Acquiring Firm and Target Firm if Exchange Ratio is 0.7:1

- (a) Post-merger EPS:

$$EPS_{AT} = E_{AT} / N_{AT}$$

In this case,

$$E_{AT} = \text{Rs. } 800 \text{ Lakhs} + \text{Rs. } 224 \text{ Lakhs} = \text{Rs. } 1024 \text{ Lakhs}$$

$$N_{AT} = N_A + (ER \times N_T) = 20 \text{ Lakhs} + (0.7 \times 8 \text{ Lakhs}) = 25.6 \text{ Lakhs}$$

$$\text{So, } EPS_{AT} = \text{Rs. } 1024 \text{ Lakhs} / 25.6 \text{ Lakhs} = \text{Rs. } 40.00$$

- (b) Impact on EPS:

	XYZ Ltd.,	ABC Ltd.,
Pre-merger EPS per share of XYZ Ltd.	40.00	40*
Post-merger EPS	40.00	40
Impact on EPS	No Change	No Change

* Equivalent EPS for XYZ Ltd.,

= Pre-merger EPS / Exchange Ratio

= Rs. 28.00 / 0.7

= Rs. 40.00

(ii) Gain or Loss from Merger if Exchange Ratio is 1:1

(a) Post-merger EPS:

$$EPS_{AT} = E_{AT} / N_{AT}$$

In this case,

$$E_{AT} = \text{Rs. 800 Lakhs} + \text{Rs. 224 Lakhs} = \text{Rs. 1024 Lakhs}$$

$$N_{AT} = N_A + (ER \times N_T) = 20 \text{ Lakhs} + (1 \times 8 \text{ Lakhs}) = 28 \text{ Lakhs}$$

$$\text{So, } EPS_{AT} = \text{Rs. 1024 Lakhs} / 28 \text{ Lakhs} = \text{Rs. 36.57}$$

(b) Calculation of Market Price per Share:

$$MPS_{AT} = EPS_{AT} \times PE_{AT}$$

$$\text{So, } MPS_{AT} = \text{Rs. 36.57} \times 6.25 = \text{Rs. 228.57}$$

(c) Calculation of Gain or Loss to Shareholders of M/s BRB Ltd.,

$$\text{Gain to Shareholders of Target Firm} = [N_T \text{ after Merger} \times MPS_{AT}] - [N_T \times MPS_T]$$

$$= (8 \text{ Lakhs} \times \text{Rs. 228.57}) - (8 \text{ Lakhs} \times \text{Rs. 160}) = \text{Rs. 548.56 Lakhs}$$

(iii) Calculation of Gain to Shareholders of M/s KPMS Ltd if Exchange Ratio is 1:1

$$\text{Gain to Shareholders of Acquiring Firm} = [N_A \text{ after Merger} \times MPS_{AT}] - [N_A \times MPS_A]$$

$$= (20 \text{ Lakhs} \times \text{Rs. 228.57}) - (20 \text{ Lakhs} \times \text{Rs. 250}) = \text{(-) Rs. 428.60 Lakhs}$$

(iv) Maximum Exchange Ratio Acceptable to Shareholders of M/s KPMS Ltd.

$$ER_A = \frac{-N_A}{N_T} + \frac{(E_{AT} \times PE_{AT})}{P_A N_T}$$

Here,

$$N_A = 20 \text{ Lakh Shares}$$

$$N_T = 8 \text{ Lakh Shares}$$

$$E_{AT} = \text{Rs. 1024 Lakhs}$$

$$PE_{AT} = 6.25$$

$$P_A = \text{Rs. 250}$$

So,

$$ER_A = \frac{-20 \text{ Lakhs}}{8 \text{ Lakhs}} + \frac{(\text{Rs. 1024 Lakhs} \times 6.25)}{(\text{Rs. 250} \times 8 \text{ Lakhs})}$$

$$= 0.7 \text{ i.e., } \mathbf{0.7:1}$$

Question 1(b) [8 Marks]:

Following are the details of close-ended equity schemes of two mutual funds as on 31/08/2021:

Particulars	AJ Mutual Fund	RP Mutual Fund
N.A.V (p.u.)	Rs. 80 (consisting 95% equity & remaining cash balance)	Rs. 61 (consisting Rs. 60 equity & remaining cash balance)
Sharpe Ratio	1.5	3
Treynor Ratio	12	10
Standard Deviation	10	6

There is no change in portfolios during the September month.

Monthly cost is Rs. 0.50 per unit for each mutual fund scheme.

Share market rose by 2% in the month of September.

You are required to calculate Expected N.A.V. p.u. as on 30/09/2021 for both the schemes.

Solution

NAV on 31.08.2021 and break-up:

	AJ Mutual Fund		RP Mutual Fund	
	Proportion	Per Unit	Proportion	Per Unit
Equity	95%	76.00	-	60.00
Cash	5%	4.00	-	1.00
NAV per unit		80.00		61.00

NAV on 30/09/2021:

Monthly cost per unit is Rs. 0.50

Hence, the cash balance per unit by the end of month will be:

AJ Mutual Fund: Rs. 4.00 – Rs. 0.50 = Rs. 3.50

RP Mutual Fund: Rs. 1.00 – Rs. 0.50 = Rs. 0.50

The value of equity by the end of the month depends on the change in the market.

The market is expected to rise by 2% in a month's time.

% Change in Market X Beta = % Change in Value of Equity

Hence, for ascertaining the value of equity, it is necessary to ascertain the Beta of the Equity in the Portfolio.

This can be ascertained with the help of Sharpe's and Treynor's measure given in the problem.

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

Since Sharpe's Measure and Standard Deviation for the both the funds are available, (Rp-Rf) can be calculated by multiplying the Sharpe's measure with Standard Deviation.

That is, (Rp-Rf) = Sharpe's Measure X Standard Deviation.

For AJ Mutual Fund: $(R_p - R_f) = 1.5 \times 10 = 15.00$

For RP Mutual Fund: $(R_p - R_f) = 3 \times 6 = 18.00$

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

For both the funds, Treynor's Measure and $(R_p - R_f)$ is known. Hence, Beta can be calculated by dividing $(R_p - R_f)$ with Treynor's Measure

That is, $\text{Beta} = (R_p - R_f) / \text{Treynor's Measure}$.

So,

For AJ Mutual Fund: $\text{Beta} = 15 / 12 = 1.25$

For RP Mutual Fund: $\text{Beta} = 18 / 10 = 1.80$

Value of Equity under both the funds on 30/09/2021 will be:

% Change in Market X Beta = % Change in Value of Equity

For AJ Mutual Fund: $2\% \times 1.25 = 2.5\%$

For RP Mutual Fund: $2\% \times 1.80 = 3.6\%$

So,

Equity Value under AJ Mutual Fund will be: $\text{Rs. } 76 + (2.5\% \text{ of Rs. } 76) = \text{Rs. } 77.90$

Equity Value under RP Mutual Fund will be: $\text{Rs. } 60 + (3.6\% \text{ of Rs. } 60) = \text{Rs. } 62.16$

So, NAV per unit on 30/09/2021 will be:

	Rs.	
	AJ Mutual Fund	RP Mutual Fund
Equity	77.90	62.16
Cash	3.50	0.50
NAV per Unit	81.40	62.66

Question 1(c) [4 Marks]:

What is the mode of financing called in start-ups, when a person attempts to found and build a company from personal finances or from the operating revenues of a new company? Explain briefly the methods of this mode.

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.

A common mistake made by most founders is that they make unnecessary expenses towards marketing, offices and equipment they cannot really afford. So, it is true that more money at the inception of business leads to complacency and wasteful expenditure. On the other hand, investment by start-ups from their own savings leads to cautious approach. It curbs wasteful expenditures and enable the promoter to be on their toes all the time.

Here are some of the methods in which a start-up firm can bootstrap:

- (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. The Factor gets hold of the receivables of the organisation and assumes the task of collecting them, along with carrying out all the paperwork. Factoring reduces maintenance and collection costs for the company, although it comes at a cost.

Leasing is another popular method of bootstrapping. 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 2(a) [8 Marks]:

Following is the information of M/s DY Ltd., for the year ending 31/03/2021:

Particulars	Rs. Lakhs
Sales	1000
Operating Expenses including interest	620
8% Debentures	250
Equity Share Capital (Face Value Rs. 10 each)	250
Reserves and Surplus	250
Market Value of DY Ltd.,	900
Corporate Tax Rate	30%
Risk-free Rate of Return	7%
Market Rate of Return	12%
Equity Beta	1.4

You are required to-

- (i) Calculate Weighted Average Cost of Capital of DY Ltd.
- (ii) Calculate Economic Value Added.
- (iii) Calculate Market Value Added.

Solution

Question (i): Calculation of Weighted Average Cost of Capital:

$$WACC(K) = K_d W_d + K_e W_e$$

$$K_d = \text{Cost of Debt} = R(1-T) = 8\% (1-0.30) = 5.60\%$$

$$K_e = \text{Cost of Equity} = R_f + \beta (R_m - R_f) = 7\% + 1.4 (12\% - 7\%) = 14\%$$

Total Debt = Rs. 250 Lakhs

Total Equity = Equity Share Capital + Reserves and Surplus = Rs. 250 Lakhs + Rs. 250 Lakhs
= Rs. 500 Lakhs

Total Capital employed = Rs. 250 Lakhs + Rs. 500 Lakhs = Rs. 750 Lakhs

$$W_d = \text{Weight of Debt} = \text{Rs. 250 Lakhs} / \text{Rs. 750 Lakhs} = 1/3 = 33.333\%$$

$$W_e = \text{Weight of Equity} = \text{Rs. 500 Lakhs} / \text{Rs. 750 Lakhs} = 2/3 = 66.667\%$$

$$\begin{aligned}\text{So, } K &= (5.6\% \times 1/3) + (14\% \times 2/3) \\ &= 1.8667\% + 9.3333\% \\ &= \mathbf{11.20\%}\end{aligned}$$

Question (ii): Calculation of Economic Value Added (EVA):

$$\text{EVA} = \text{NOPAT} - (\text{WACC} \times \text{Capital Employed})$$

1. Capital Employed: Rs. 750 Lakhs

2. WACC: 11.20%

3. Calculation of NOPAT

$$\text{NOPAT} = \text{Operating Profits (i.e., EBIT)} \times (1-T)$$

$$\text{Operating Profits} = \text{Sales} - \text{Operating Cost}$$

Sales = Rs. 1000 Lakhs

Operating Cost including Interest = Rs. 620 Lakhs

Interest on Debentures = 8% of Rs. 250 Lakhs = Rs. 20 Lakhs

So, Operating Cost = Rs. 620 Lakhs (-) Rs. 20 Lakhs = Rs. 600 Lakhs

Earnings Before Interest and Tax (i.e., Operating Profits) = Rs. 1000 Lakhs (-) Rs. 600 Lakhs = Rs. 400 Lakhs

So, NOPAT = Rs. 400 Lakhs $\times$ (1-0.30) = Rs. 280 Lakhs

4. Calculation of EVA:

$$\begin{aligned}\text{EVA} &= \text{NOPAT} - (\text{WACC} \times \text{Capital Employed}) \\ &= \text{Rs. 280 Lakhs} - (11.20\% \times \text{Rs. 750 Lakhs}) \\ &= \text{Rs. 280 Lakhs} - \text{Rs. 84.00 Lakhs} \\ &= \mathbf{\text{Rs. 196.00 Lakhs}}\end{aligned}$$

Question (iii): Calculation of Market Value Added (MVA):

$$\text{MVA} = \text{Market Value of Equity Shares} - \text{Book Value of Shareholders' Equity}$$

$$\begin{aligned}\text{Book Value of Shareholders' Equity} &= \text{Equity Share Capital} + \text{Reserves and Surplus} \\ &= \text{Rs. 250 Lakhs} + \text{Rs. 250 Lakhs} \\ &= \mathbf{\text{Rs. 500 Lakhs}}\end{aligned}$$

Problem has given the Market Value of the company (i.e., DY Ltd.).

Hence, Market Value of Equity Shares should be calculated as follows:

$$\text{Market Value of the Company} - \text{Value of Debt}$$

$$\begin{aligned}\text{So, Market Value of Equity Shares of DY Ltd.,} &= \text{Rs. 900 Lakhs} - \text{Rs. 250 Lakhs} \\ &= \mathbf{\text{Rs. 650 Lakhs}}\end{aligned}$$

Therefore,

$$\text{MVA} = \text{Rs. 650 Lakhs} - \text{Rs. 500 Lakhs} = \mathbf{\text{Rs. 150 Lakhs}}$$

Question 2(b) [8 Marks]:

On 31/08/2021 Mr. R has taken Long Position of Two lots of Nifty Futures at 17300.
One lot Nifty Future is 50 units.
Initial Margin required is 10% of Contract Value.
Maintenance Margin required is 80% of Initial Margin.

The closing price of 5 days are given below:

Date	Closing Price of Nifty Future
01/09/2021	17340
02/09/2021	17180
03/09/2021	16990
06/09/2021	16900
07/09/2021	17120

You are required to-

- (i) Prepare a statement showing the daily balances in the margin account and payment on margin calls, if any.
- (ii) Compute the Gain or Loss of Mr. R, if contract squared off on 07/09/2021.
- (iii) What would be the Gain or Loss if Mr. R, had taken the short position?

Solution

Price of Nifty Futures: Rs. 17300

Contract Size: 50

Value of one Nifty Future Contract: Rs. 17300 X 50 = Rs. 8,65,000

So, Value of Two Nifty Future Contracts = Rs. 8,65,000 X 2 = **Rs. 17,30,000**

Initial Margin: Rs. 17,30,000 X 10% = Rs. 1,73,000

Maintenance Margin: Rs is 80% of Initial Margin = 80% of Rs. 1,73,000 = Rs. 1,38,400

In Case of an Investor who has taken Long Position in Futures at Rs. 17300:

In Case of **Long Position**, Increase in Underlying is **Profit** and Fall in Underlying is **Loss**.

So, Marking to Market = (Value of the Underlying on the present day – Value of the underlying on the previous day) X 50 X 2

	Rs.				
	Opening Balance	Marking to Market	Balance	Variation Margin	Closing Balance
31/08/2021				1,73,000	1,73,000
01/09/2021	1,73,000	4,000 ¹	1,77,000	0	1,77,000
02/09/2021	1,77,000	(16,000) ²	1,61,000	0	1,61,000
03/09/2021	1,61,000	(19,000) ³	1,42,000	0	1,42,000
06/09/2021	1,42,000	(9,000) ⁴	1,33,000	40,000	1,73,000
07/09/2021	1,73,000	22,000 ⁵	1,95,000	0	1,95,000

1. $(17340 - 17300) \times 50 \times 2$
2. $(17180 - 17340) \times 50 \times 2$
3. $(16990 - 17180) \times 50 \times 2$
4. $(16900 - 16990) \times 50 \times 2$
5. $(17120 - 16900) \times 50 \times 2$

Note: On 06/09/2021, the Balance after adjusting 'loss from marking to market' is less than 'maintenance margin'. Hence, additional amount (i.e., variation margin) is brought in. The variation margin must be the amount required to make the balance equal to 'initial margin.'. Hence, when the balance in the account is Rs. 1,33,000, the variation margin is (Rs. 1,73,000 – Rs. 1,33,000) Rs. 40,000

Net Profit / Loss:

	Rs.
Total Deposits	2,13,000
Total Withdrawals and Closing Balance	<u>1,95,000</u>
LOSS	18,000

Alternatively,

Price at which Future Contract is entered: 17,300

Position taken: Long

Price on 07/09/2021 at which squaring off is made: 17,120

Loss per unit of underlying: Rs. 180

Total Loss on 2 Future Contracts: Rs. 180 X 50 X 2 = **Rs. 18,000**

In Case of an Investor who has taken Short Position in Futures at Rs. 17300:

In Case of **Short Position**, Increase in Underlying is **Loss** and Fall in Underlying is **Profit**.

So, Marking to Market = (Value of Underlying on the previous day – Value of underlying on the present day) X 50 X 2

	Rs.				
	Opening Balance	Marking to Market	Balance	Variation Margin	Closing Balance
31/08/2021				1,73,000	1,73,000
01/09/2021	1,73,000	(4,000) ¹	1,69,000	0	1,69,000
02/09/2021	1,69,000	16,000 ²	1,85,000	0	1,85,000
03/09/2021	1,85,000	19,000 ³	2,04,000	0	2,04,000
06/09/2021	2,04,000	9,000 ⁴	2,13,000	0	2,13,000
07/09/2021	2,13,000	(22,000) ⁵	1,91,000	0	1,91,000

1. (17300 – 17340) X 50 X 2

2. (17340 – 17180) X 50 X 2

3. (17180 – 16990) X 50 X 2

4. (16990 – 16900) X 50 X 2

5. (16900 – 17120) X 50 X 2

Note: On none of the above dates, the balance in the account has gone below 'Maintenance Margin.' Hence, no margin calls are necessary.

Net Profit / Loss:

	Rs.
Total Deposits	1,73,000
Total Withdrawals and Closing Balance	<u>1,91,000</u>
PROFIT	18,000

Alternatively,
Price at which Future Contract is entered: 17,300
Position taken: Short
Price on 07/09/2021 at which squaring off is made: 17,120
Profit per unit of underlying: Rs. 180
Total Profit on 2 Future Contracts: Rs. 180 X 50 X 2= **Rs. 18,000**

Question 2(c) [4 Marks]:

Which type of risk covers the default by the counterparty? List out the ways to manage this risk.

Answer

The risk which covers default by counter-party is 'Counter Party Risk.' This risk occurs due to non-honouring of obligations by the counter party which may fail to deliver the goods for payment already made or vice-versa or repayment of borrowings and interest etc. thus, this risk also covers credit risk.

The various hints that may provide counter party risk are as follows:

- (a) Failure to obtain necessary resources to complete the project or transaction undertaken.
- (b) Any regulatory restrictions from the Government.
- (c) Hostile action of foreign government.
- (d) Let down by third party.
- (e) Has become insolvent.

The various techniques to manage this type of risk are as follows:

- 1. Carrying out due diligence before dealing with any third party.
- 2. Do not over commit to a single entity or group of connected entities.
- 3. Know your exposure limits.
- 4. Review the limits and procedure for credit approval regularly.
- 5. Rapid action in the event of any likelihood of defaults.
- 6. Use of performance guarantee, insurance or other instruments.

Question 3(a) [8 Marks]:

On 01/04/2020 Mr. K invested in the following companies to make his portfolio:

Name of the Company	Number of Equity Shares purchased	Face value per Equity Share	Purchase Price per Equity Share
PK Ltd.,	2000	Rs. 10	Rs. 210
KD Ltd.,	1000	Rs. 10	Rs. 290

Mr. K expects that-

- (i) Dividend for Financial Year 2020-21 of PK Ltd., and KD Ltd., will be 40% and 50% respectively.
- (ii) Probabilities of the Market Price as on 31/03/2021 are as under:

Probability Factor	Market value per Equity Share of PK Ltd.,	Market value per Equity Share of KD Ltd.,
0.4	200	300
0.4	240	320
0.2	260	350

You are required to-

- (i) Calculate the Expected Price of Equity Shares of both the companies as on 31/03/2021.
(ii) Calculate the Expected Average Return of the Portfolio for the year 2020-21

Solution

Question (i): Calculation of Expected Price of Equity Shares on 31/03/2021:

For Stock of PK Ltd.

If price on 31.03.2021 is- (Rs.)	Probability	X x Probability
200	0.40	80.00
240	0.40	96.00
260	0.20	52.00
Average Price (i.e., Expected Price)		228.00

For Stock of KD Ltd.

If price on 31.03.2021 is- (Rs.)	Probability	X x Probability
300	0.40	120.00
320	0.40	128.00
350	0.20	70.00
Average Price (i.e., Expected Price)		318.00

Question (ii): Calculation of Average Portfolio Return:

$$\text{Portfolio Return} = \sum W_i \bar{R}_i$$

1. Calculation of Stock Returns:

$$\text{Holding Period Yield (HPY)} = \frac{D_1 + (\text{Expected } P_1 - P_0)}{P_0}$$

$$\text{For Stock of PK Ltd: HPY} = \frac{\text{Rs. } 4 + (\text{Rs. } 228 - \text{Rs. } 210)}{\text{Rs. } 210} \times 100 = 10.48\%$$

$$\text{For Stock of KD Ltd: HPY} = \frac{\text{Rs. } 5 + (\text{Rs. } 318 - \text{Rs. } 290)}{\text{Rs. } 290} \times 100 = 11.38\%$$

2. Calculation of Weights:

Stock of	Cost of Acquisition (Rs.)	Weight
PK Ltd.,	4,20,000 (2000 X Rs. 210)	420000 / 710000 = 42/71
KD Ltd.,	2,90,000 (1000 X Rs. 290)	290000 / 710000 = 29/71
	7,10,000	

Calculation of Portfolio Returns:

$$\text{Portfolio Return} = \sum W_i \bar{R}_i = \left(10.48\% \times \frac{42}{71}\right) + \left(11.38\% \times \frac{29}{71}\right) = \mathbf{10.85\%}$$

Question 3(b) [8 Marks]:

On 1st July 2021, Mr. P has made the following investment:

Name of the Company	No. of Equity Shares	Beta	Purchase Price per Equity Share
ML Ltd.,	1000	1.25	Rs. 700

He wants to hold the investment till the end of September 2021 with an expectation of huge dividends to be announced in the AGM.

On the date of investment, September Nifty Futures are quoting at 17500 and tradeable with lot size of 50 for each contract.

You are the investment advisor to Mr. P,

- (i) Please advise Mr. P how to hedge his market exposure using the available data.
- (ii) Calculate the profit or loss of Mr. P during the expiry of September 2021 futures in the following situation:
 - (a) Nifty Futures rise by 10%
 - (b) ML Ltd., falls by 5%
- (iii) Is it possible for stock as well as Nifty to raise or fall at the same percentage? Please state the reason.

Solution

Question (i): Hedging Strategy:

Investment in Shares must be hedged by taking opposite position in Index Futures.

Since, Long position is taken in Shares, **Short Position must be taken in Nifty Futures**, for hedging.

Number of Index Future Contracts to be **sold** =

Hedge Ratio (or Beta) $\times \frac{\text{Value of Investment to be hedged}}{\text{Value of One Index Future Contract}}$

$$= 1.25 \times \frac{(1000 \text{ Shares} \times \text{Rs. } 700)}{(50 \times \text{Rs. } 17500)} = 1$$

Question (ii): Calculation of Profit or Loss in different scenarios:

Situation (a): When Nifty Futures rise by 10%

% Change in Market $\times$ Beta = % Change in Stock

So, When Index is zooming by 10%, Stock Prices will be rising by $10\% \times 1.25 = 12.5\%$

Asset	Position Taken	Change in the Price of Asset / Underlying	Outcome
Shares	Long	Rise	Profit
Index Futures	Short	Rise	Loss

	Rs.
Profit on Stock [Rs. 700 $\times$ 12.5% $\times$ 1000 Shares]	87,500
Loss on Futures [Rs. 17500 $\times$ 10% $\times$ 50 Units per Contract $\times$ 1 Contract]	(87,500)

Situation (b): When Price of ML Stock falls by 5%

% Change in Market X Beta = % Change in Stock

So, When stock price is falling by 5%, Nifty Futures will be falling by $5\% / 1.24 = 4\%$

Asset	Position Taken	Change in the Price of Asset / Underlying	Outcome
Shares	Long	Fall	Loss
Index Futures	Short	Fall	Profit

	Rs.
Loss on Stock [Rs. 700 X - 5% X 1000 Shares]	(35,000)
Profit on Futures [Rs. 17500 X - 4% X 50 Units per Contract X 1 Contract]	35,000

Question (iii):

Stock price and Nifty can rise and fall by same percentage when the Beta value between the Stock and Nifty is 1.

Question 3(c) [4 Marks]:

Describe briefly on which principles Technical Analysis is based.

Answer

The field of Technical Analysis is based on the following assumptions:

1. The Market Discounts everything

Technical analysis assumes that, at any given time, a stock's price reflects everything that has or could affect the company – including fundamental factors. Technical analysts believe that the company's fundamentals along with broader economic factors are market psychology, are all priced into the stock, removing the need to actually consider these factors separately. This only leaves analysis of the price movement, with technical theory views as a product of the supply and demand for a particular stock in the market.

2. Price moves in trends

In Technical analysis, price movements are believed to follow trends. This means that after a trend is established, the future movement is more likely to be in the same direction as the trend than to be against it. Most technical trading strategies are based on this assumption.

3. History tends to repeat itself

Another important idea in technical analysis is that history tends to repeat itself, mainly in terms of price movement. The repetitive nature of price movement is attributed to market psychology, i.e., market participants tend to provide a consistent reaction to similar market stimuli over time. Technical analysis uses chart patterns to analyse market movements and understand trends. Although many of these charts have been used for more than 100 years, they are still believed to be relevant because they illustrate patterns in price movements that often repeat themselves.



VITTAM PRAVINA GURUSHALA

**FOR CA MAY 2022 AND NOVEMBER 2022 EXAMINATIONS
&
FOR CMA JUNE 2022 AND DECEMBER 2022 EXAMINATIONS**

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Question 4(a) [8 Marks]:

A US Company wants to setup a manufacturing plant in India which requires an initial outlay of Rs. 8 Million. It is expected to have a useful life of 5 years with a salvage of Rs. 2 Million. The company follows straight line method of depreciation. To support additional level of activity, investment would require one-time additional working capital of Rs. 1 Million.

Since the cost of production is lower in India, the variable cost of production would be Rs. 30 per unit. Additional fixed cost per annum is estimated at Rs. 0.50 Million. The company is projecting its annual sales to 80000 units at the price of Rs. 100 per unit. Applicable tax rate to the company is 34% and its cost of capital is 8%.

Inflation rates in US and India are expected to be 8% and 9% respectively. The current exchange rate is Rs. 72 per US Dollar.

Assuming that all profit will be repatriated every year and there will be no withholding taxes, estimate the net present value of the proposed project in India and evaluate its feasibility.

PVF @ 8% for the five years are as under:

Year	1	2	3	4	5
PV of Re. 1 @ 8%	0.926	0.857	0.794	0.735	0.681

Solution

1. Calculation of Initial Investment:

Initial Investment in INR: Rs. 80 Lakhs + Rs.10 Lakhs = **Rs. 90 Lakhs.**

Initial Investment in USD: Rs. 90 Lakhs / Rs. 72 = **1.25 Lakh USD**

2. Calculation of Nominal Revenues and Costs

Revenues at Real value: 80000 Units X Rs. 100 per unit = Rs. 80 Lakhs

Variable cost at Real Value: 80000 Units X Rs. 30 per unit = Rs. 24 Lakhs

Fixed Cost at Real Value: Rs. 50 Lakhs

Inflation Rate in India: 9%

	Real Value	Nominal Values				
		Year 1	Year 2	Year 3	Year 4	Year 5
		$\frac{\text{Real Value}}{(1.09)^1}$	$\frac{\text{Real Value}}{(1.09)^2}$	$\frac{\text{Real Value}}{(1.09)^3}$	$\frac{\text{Real Value}}{(1.09)^4}$	$\frac{\text{Real Value}}{(1.09)^5}$
Revenues	80.00	87.20	95.05	103.60	112.93	123.09
Variable Cost	24.00	26.16	28.51	31.08	33.88	36.93
Additional Fixed Cost	50.00	54.50	59.41	64.75	70.58	76.93

3. Calculation of Depreciation

$$\text{Depreciation} = \frac{\text{Cost of the Asset} - \text{Scrap Value}}{\text{Useful Life}}$$

$$\text{So, Depreciation} = \frac{\text{Rs. 80 Lakhs} - \text{Rs. 20 Lakhs}}{5 \text{ Years}} = \text{Rs. 12 Lakhs.}$$

4. Calculation of Future Spot Rate:

Future Spot Rate per USD is calculated in accordance with Purchasing Power Parity Theory:

$$\frac{F}{S} = \frac{(1+ih)^t}{(1+if)^t} \text{ or } F = \frac{(1+ih)^t}{(1+if)^t} \times S$$

$$\text{Year 1: } F = \frac{(1.09)^1}{(1.08)^1} \times 72 = \text{Rs. 72.6667}$$

$$\text{Year 2: } F = \frac{(1.09)^2}{(1.08)^2} \times 72 = \text{Rs. 73.3395}$$

$$\text{Year 3: } F = \frac{(1.09)^3}{(1.08)^3} \times 72 = \text{Rs. 74.0186}$$

$$\text{Year 4: } F = \frac{(1.09)^4}{(1.08)^4} \times 72 = \text{Rs. 74.7039}$$

$$\text{Year 5: } F = \frac{(1.09)^5}{(1.08)^5} \times 72 = \text{Rs. 75.3956}$$

5. Calculation of Cash Flows:

	Rs. In Lakhs				
YEAR	1	2	3	4	5
<u>Revenues in Nominal terms</u>	<u>87.20</u>	<u>95.05</u>	<u>103.60</u>	<u>112.93</u>	<u>123.09</u>
Variable Cost in Nominal terms	26.16	28.51	31.08	33.88	36.93
Additional Fixed cost in Nominal terms	54.50	59.41	64.75	70.58	76.93
Depreciation	<u>12.00</u>	<u>12.00</u>	<u>12.00</u>	<u>12.00</u>	<u>12.00</u>
Total Cost	<u>92.66</u>	<u>99.92</u>	<u>107.83</u>	<u>116.46</u>	<u>125.86</u>
Profits Before Tax	-5.46	-4.87	-4.23	-3.53	-2.77
Less: Tax @ 34%	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Profits After Tax	-5.46	-4.87	-4.23	-3.53	-2.77

Add: Depreciation	12.00	12.00	12.00	12.00	12.00
Add: Salvage	-	-	-	-	20.00
Add: Working Capital recovery					<u>10.00</u>
Cash Inflows	<u>6.54</u>	<u>7.13</u>	<u>7.77</u>	<u>8.47</u>	<u>39.23</u>
INR/USD	72.6667	73.3395	74.0186	74.7039	75.3956
Cash Flows repatriated in Lakh USD	0.0900	0.0972	0.1050	0.1134	0.5203

6. Calculation of Net Present Value:

Year	Cash Inflows (in Lakh USD)	PV of \$1 at 8%	PV of Cash Inflows (in Lakh USD)
1	0.0900	0.926	0.0833
3	0.0972	0.857	0.0833
4	0.1050	0.794	0.0834
5	0.1134	0.735	0.0833
5	0.5203	0.681	0.3544
			0.5974
Less: Cash Outflows			<u>1.2500</u>
Net Present Value			-0.5623

Setting up the manufacturing plant in India is not feasible to the US Company.

Question 4(b) [8 Marks]:

A Japanese company effected sales to X Ltd., an Indian company, the payment being due 3 months from the date of invoice. The invoice amount is JPY 216 Lakhs. At today's spot rate, it is equivalent to Rs. 50 lakhs. It is anticipated that the exchange rate will decline by 8% over the 3 months period and in order to protect the JPY payments, the importer proposes to take appropriate action in the foreign exchange market. The 3 months forward rate is presently quoted as JPY 4.12 per rupee. You are required to calculate the expected loss and to show how it can be hedged by a forward contract.

Solution

$$(\text{Rs/JPY})_{\text{Spot}} = \text{Rs. 50 Lakhs} / 216 \text{ Lakh JPY} = 0.2315$$

$$(\text{JPY/Re})_{\text{Spot}} = 216 \text{ Lakh JPY} / \text{Rs. 50 Lakhs} = 4.32$$

A decline in home currency will be detrimental to the interest of an importer. So, the decline in exchange rate of 8% is of home currency.

$$\text{So, } (\text{JPY/Re})_{\text{Future Spot}} = 4.32 - 8\% \text{ of } 4.32 = 3.9744$$

$$\text{Therefore, } (\text{Rs/JPY})_{\text{Future Spot}} = \frac{1}{3.9744} = 0.2516$$

Hence, when there is no hedging, the **transaction loss** to the importer would be:

$$(0.2315 - 0.2516) \times 216,00,000 \text{ JPY} = \text{Rs. 4,34,160}$$

If hedged with Forward:

Forward Rate: (Yen/Re) = 4.12

So, Cash Outflows will be: $216,00,000 \text{ Yen} \times \frac{1}{4.12} = \text{Rs. 52,42,718.45}$

So, **Loss** when hedged with Forward: Rs. 50,00,000 – Rs. 52,42,718.45 = **Rs. 2,42,718.45**

$$\begin{aligned} \text{Hedge Efficiency} &= \frac{\text{Savings in Loss on account of hedging}}{\text{Loss when there is no hedge}} \\ &= \frac{\text{Rs. 4,34,160.00} - \text{Rs. 2,42,718.45}}{\text{Rs. 4,34,160.00}} \times 100 = \text{44.09\%} \end{aligned}$$

Question 4(c) [4 Marks]:

Explain the pricing of the securitized instruments

Answer

Pricing of securitized instruments is an important aspect of securitization. While pricing the instruments, it is important that it should be acceptable to both originators as well as to the investors. On the same basis pricing of securities can be divided into following two categories:

From Originator's Angle

From Originator's point of view, the instruments can be priced at a rate at which originator has to incur an outflow and if that outflow can be amortized over a period of time by investing the amount raised through securitization.

From Investor's Angle

From an investor's angle security price can be determined by discounting best estimate of expected future cash flows using rate of yield to maturity of a security and comparable security with respect to credit quality and average life of the securities. This yield can also be estimated by referring the yield curve available for marketable securities, though some adjustments are needed on account of spread points, because of credit quality of the securitized instruments.

Question 5(a) [8 Marks]:

TN Ltd., has Rs. 600 Lakh 10% bonds outstanding with 5 years remaining to maturity. Since interest rate is falling, TN Ltd., is planning of refunding these bonds with a Rs. 600 Lakh issue of 5 year bonds carrying a coupon rate of 7%. Issue cost of the new bond will be Rs. 12 Lakhs and call premium is 3%. Rs. 18 Lakhs being the unamortised portion of the issue cost of old bonds can be written off. Tax Rate applicable to TN Ltd., is 30%.

You are required to analyse Bond Refunding Decision.

PVF @ 7% and 4.9% for five years are as under:

Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
7%	0.935	0.873	0.816	0.763	0.713	4.100
4.9%	0.953	0.909	0.866	0.826	0.787	4.341

Solution

Alternative One: When the tax benefit at the end of year 1 is not discounted:

After-tax cost of Debt is 4.9% [i.e., $R(1-T) = 7\%(1-0.3)$]. This rate is considered as the discount factor.

IF THE EXISTING BONDS ARE CALLED BACK			
BENEFITS	Rs.	COSTS	Rs.
<u>Savings in Interest</u> (Rs. 6 Crores X 3% X 4.341)	7813800	<u>PV of Loss of Tax Benefit on Savings in Interest</u> (Rs. 6 Crores X 3% X 30% X 4.341)	2344140
<u>Tax Benefit on Premium on Call-back</u> (Rs. 18,00,000 X 30%)	540000	<u>Premium on Call-back</u> (3% X Rs. 6 crores)	1800000
<u>PV of Tax Savings on Amortisation of flotation cost</u> (Rs. 1200000/5 X 30% X 4.341)	312552	<u>Flotation cost on issue of New Bonds</u>	1200000
<u>Tax benefit Unamortised flotation cost on existing bonds</u> (Rs. 18,00,000 X 30%)	540000	<u>PV of Tax benefit lost on flotation cost of existing bonds</u> (Rs. 1800000/5 X 30% X 4.341)	468828
	9206352		5812968

Net Benefit 3393384

Conclusion: Since, the call-back is resulting in a net benefit of Rs. 33,93,384 in present value terms, it is advisable to refund the existing bonds and issue new bonds.

Alternative Two: When the tax benefit at the end of year 1 is discounted:

After-tax cost of Debt is 4.9% [i.e., $R(1-T) = 7\%(1-0.3)$]. This rate is considered as the discount factor.

IF THE EXISTING BONDS ARE CALLED BACK			
BENEFITS	Rs.	COSTS	Rs.
<u>Savings in Interest</u> (Rs. 6 Crores X 3% X 4.341)	7813800	<u>PV of Loss of Tax Benefit on Savings in Interest</u> (Rs. 6 Crores X 3% X 30% X 4.341)	2344140
<u>Tax Benefit on Premium on Call-back</u> (Rs. 18,00,000 X 30% X 0.953)	514620	<u>Premium on Call-back</u> (3% X Rs. 6 crores)	1800000
<u>PV of Tax Savings on Amortisation of flotation cost</u> (Rs. 1200000/5 X 30% X 4.341)	312552	<u>Flotation cost on issue of New Bonds</u>	1200000

Tax benefit Unamortised flotation cost on existing bonds (Rs. 18,00,000 X 30% X 0.953)	514620	PV of Tax benefit lost on flotation cost of existing bonds (Rs. 1800000/5 X 30% X 4.341)	468828
	9155592		5812968

Net Benefit 3342624

Note: Tax-savings are calculated at the end of the year. Hence, for the tax benefits at the end of year 1, present value is calculated using present value factor at the end of year 1.

Conclusion: Since, the call-back is resulting in a net benefit of Rs. 33,42,624 in present value terms, it is advisable to refund the existing bonds and issue new bonds.

Question 5(b) [8 Marks]:

TT Ltd., is planning to hedge its foreign exchange risk. It has made a purchase on 1st April, 2021 for which it has to make a payment of US\$ 1 Lakh on 30/09/2021. The present exchange rate is 1 US\$ = Rs. 73. It can purchase forward 1 US\$ at Rs. 74. TT Ltd., will have to make an upfront premium @ 1% of the forward amount purchased. The cost of funds to the company is 10% p.a.

In the following situations, compute the gain / loss of TT Ltd., if they hedge with the exchange rate on 30/09/2021, as:

- (i) Rs. 76 per US\$.
- (ii) Rs. 70 per US\$.
- (iii) Rs. 79 per US\$.

Note: Calculation to be done on monthly basis:

Solution

Cost of entering into Forward Contract:

	Rs.
Upfront Premium [100000\$ X Rs. 74 per \$ X 1%]	74,000
Add: Cost of Funds for 6 Months [Rs. 74,000 X e^{rt} = Rs. 74,000 X $e^{0.10 \times 6/12}$ = Rs. 74,000 X $e^{0.05}$ = Rs. 74,000 X 1.05127] – Rs. 74,000	3794
	77,794

Alternatively,

Upfront Premium (100000 US \$ X Rs. 74 per \$ X 1%)	74000.00
Cost of Fund for April 2021 (Rs. 74000 X 10% X 1/12)	616.67
	74616.67
Cost of Fund for April 2021 (Rs. 74616.67 X 10% X 1/12)	621.81
	75238.47
Cost of Fund for April 2021 (Rs. 75238.47 X 10% X 1/12)	626.99
	75865.46

Cost of Fund for April 2021 (Rs. 75865.46 X 10% X 1/12)	<u>632.21</u>
	76497.67
Cost of Fund for April 2021 (Rs. 76497.67 X 10% X 1/12)	<u>637.48</u>
	77135.15
Cost of Fund for April 2021 (Rs. 77135.15 X 10% X 1/12)	<u>642.79</u>
	77777.95

Calculation of Pay-off on Expiry Date:

	If Exchange Rate is-		
	Rs. 76	Rs. 70	Rs. 79
Value on Expiry per \$ (Rs.)	2.00	-4.00	5.00
Value on Expiry for the Contract (Rs.)	200000	-400000	500000
Cost of entering into Forward	<u>-77778</u>	<u>-77778</u>	<u>-77778</u>
Net Pay-off	122222	-477778	422222

Question 5(c) [4 Marks]:

Write the characteristics of venture-capital financing.

Answer

Following are the characteristic features of venture capital financing:

- Long-term Horizon: The fund would invest with a long-term horizon in mind. Minimum period of investment would be 3 years and maximum period can be 10 years.
- Lack of Liquidity: When VC invests, it takes into account the liquidity factor. It assumes that there would be less liquidity on the equity it gets and accordingly it would be investing in that format. They adjust this liquidity premium against the price and required return.
- High Risk: VC would not hesitate to take risk. It works on the principle of high risk and high return. So, high risk would not eliminate the investment choice for a venture capital.
- Equity Participation: Most of the time, VC would be investing in the form of equity of a company. This would help the VC to participate in the management and help the company grow. Besides, a lot of board decisions can be supervised by the VC if they participate in the equity of the company.

Question 6(a) [8 Marks]:

Following are the details of X Ltd., and Y Ltd.

Particulars	X Ltd.,	Y Ltd.,
Dividend per share	Rs. 4	Rs. 4
Growth Rate	10%	10%
Beta	0.9	1.2
Current market price per share	Rs. 150	Rs. 70

Other Information:

Risk-free Rate of Return	7%
Market Rate of Return	14%

- (i) Calculate the price of shares of both the companies.
- (ii) Write the comment on the valuation on the basis of price calculated and current market price.
- (iii) As an investor what course of action should be followed?

Solution

Question (i):

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

$$K_e = R_f + \beta(R_m - R_f)$$

	X Ltd.,	Y Ltd.,
$K_e = R_f + \beta(R_m - R_f)$	$7\% + 0.9(14\% - 7\%)$ = 13.3%	$= 7\% + 1.2(14\% - 7\%)$ = 15.4%
$g = \text{growth rate}$	10%	10%
$D_1 = \text{Expected Dividend}$ $= D_0 (1+g)$	Rs. 4 (1+10%) = Rs. 4.40	Rs. 4 (1+10%) = Rs. 4.40
So, Price per Share (P_0)	$\frac{\text{Rs. 4.40}}{0.133 - 0.10}$ = Rs. 133.33	$\frac{\text{Rs. 4.40}}{0.154 - 0.10}$ = Rs. 81.48

Note: It is assumed that the dividend given in the problem is current dividend (i.e., D^0)

Question (ii):

	X Ltd.,	Y Ltd.,
Intrinsic Value per Share	Rs. 133.33	Rs. 81.48
Market price per Share	Rs. 150	Rs. 75
Comment	Over-valued	Under-valued

Question (iii):

The following is the course of action for the investor:

Stock of X Ltd: Don't Invest / Sell / Go Short (if permitted)

Stock of Y Ltd: Invest / Hold / Go Long

Question 6(b) [8 Marks]:

DD Ltd., a company based in India manufactures good quality of leather bags and sells to retail outlets in India and USA. The cost of quality leather in India is very high, the company is reviewing the proposal of importing of leather in bulk from USA supplier. The estimate of net US \$ and Indian ₹ currency cash flows in nominal terms for this proposal is given below:

	Net Cash Flow (in Lakh)			
Year	0	1	2	3
In US \$	(25)	5	7	8
In ₹	0	60	80	90
If not imported, cost of leather to be purchased in India (in ₹)	400	450	500	600

Other information:

- (i) DD Ltd., evaluates all investments by using discount rate of 9% p.a.
- (ii) All US customers are invoiced in US \$. US \$ Cash flows converted into ₹ at the forward rate and discounted at Indian rate.
- (iii) Inflation in USA and India are expected to be 9% and 8% respectively.
- (iv) The current exchange rate 1 US \$ = Rs. 74.

You are required to calculate Net Present Value and recommend the decision. Present value factors @ 9% are as under:

Year 1	Year 2	Year 3
0.917	0.842	0.772

Note: Calculation to be made up to 2 decimal points.

Solution

Forward Rate for US \$ in accordance with Purchasing Power Parity Theory:

$$\frac{F}{S} = \frac{(1+ih)^t}{(1+if)^t} \text{ or } F = \frac{(1+ih)^t}{(1+if)^t} \times S$$

$$\text{Year 1: } F = \frac{(1.08)^1}{(1.09)^1} \times 74 = \text{Rs. } 73.3211$$

$$\text{Year 2: } F = \frac{(1.08)^2}{(1.09)^2} \times 74 = \text{Rs. } 72.6484$$

$$\text{Year 3: } F = \frac{(1.08)^3}{(1.09)^3} \times 74 = \text{Rs. } 71.9819$$

Cash outflows in Rs. (25 Lakh \$ X Rs. 74 per \$) + 0 = Rs. 1850 Lakhs

Calculation of Net Present Value when the leather is imported from US:

Year	In Lakhs					
	Cash Flows in US \$	Cash Flows from US in Rs.	Cash flows from India in Rs.	Total Cash Inflows (in Rs.)	PV of Re.1 @ 9%	PV of Cash Inflows (in Rs.)
1	5.00	366.6055	60.00	426.6055	0.917	391.1972
2	7.00	508.5388	80.00	588.5388	0.842	495.5497
3	8.00	575.8552	90.00	665.8552	0.772	514.0402
						1400.7871
Less: Cash Outflows						1850.0000
						Net Present Value -449.2129

Note: Since the cost of leather when imported is not given, it is assumed that there is no difference in the cost of imported leather and cost of leather when not imported. Hence, the information regarding the same is not considered in calculation of NPV.

Question 6(c) – Option (i) [4 Marks]:

Buy and hold is one of the policies of portfolio rebalancing. Briefly explain other policies of portfolio rebalancing.

Answer

There are three policies of Portfolio Rebalancing – Buy and hold policy, Constant mix policy and Constant proportion portfolio insurance policy. Under all these policies portfolio consists of stocks and bonds.

Buy and Hold Policy: This is also called 'Do Nothing Policy'. Under this policy, no balancing is required and therefore investor maintains an exposure to stocks linearly related to the value of stocks in general. The amount below which the value of portfolio should not fall will be invested in bonds and the remaining amount will be invested in stocks under this policy.

Constant Mix Policy: Under this policy, the investor maintains exposure to stocks at a constant percentage of the total portfolio. This strategy involves periodic rebalancing to desired proportion by purchasing and selling stocks as and when their prices goes down and up respectively.

Constant Proportion Portfolio Insurance Policy (CPPI): Under this policy, investor sets a floor below which he does not wish his asset to fall, which is invested in some non-fluctuating assets such as Treasury Bills, Bonds etc. The value of the portfolio under this strategy shall not fall below this specified floor under normal market conditions. This strategy performs well especially in bull market as the value of the shares purchased rises when cushion increases. In contrast in bearish market losses are avoided by sale of shares. It should however be noted that this strategy performs very poorly if the market is hurt by sharp reversals. The following formula is used to determine the equity allocation.:

Target Investment in Shares = Multiplier (Portfolio Value – Floor Value)

Multiplier is a fixed constant whose value shall be more than 1.

So, Under CPPI Policy, shares are sold when the prices fall and they are purchased when the prices rise.

Question 6(c) – Option (ii) [4 Marks]:

What are the main features of Forward Rate Agreements (FRA)?

Answer

A Forward Rate Agreement (FRA) is an agreement between two parties through which a borrower / lender protects itself from the unfavourable changes in the interest rate. Unlike Futures, FRAs are not traded on an exchange and this are called Over-the-counter (OTC) product. Following are the main features of an FRA:

- (a) Normally it is used by banks to fix interest costs on anticipated future deposits or interest revenues on variable-rate loans indexed to LIBOR.
- (b) It is an off-Balance Sheet instrument.
- (c) It does not involve any transfer of principal. The principal amount of the agreement is termed “notional” because, while it determines the amount of payment, actual exchange of principal never takes place.
- (d) It is settled at maturity in cash representing the profit or loss. A bank that sells an FRA agrees to pay the buyer the increased cost on some “notional” principal amount if some specified maturity of LIBOR is above a stipulated ‘forward rate’ on the contract maturity or settlement date. Conversely, the buyer agrees to pay the seller any decrease in interest cost if market interest rate falls below the ‘forward rate.’
- (e) Final settlement of the amounts owed by the parties to an FRA is determined by the formula:

$$\text{Payment} = \frac{(N)(RR - FR)\left(\frac{dtm}{DY}\right)}{\left[1 + RR\left(\frac{dtm}{DY}\right)\right]} \times 100$$

where,

- N = The notional principal amount of the agreement
- RR = Reference Rate for the maturity specified by the contract prevailing on the contract settlement date, typically LIBOR or MIBOR.
- FR = Agreed upon Forward Rate
- dtm = maturity of the forward rate, specified in days
- DY = Day count basis applicable to money market transactions (360 or 365 days)

If LIBOR > FR, the seller owes the payment to the buyer, and if LIBOR < FR, the buyer owes the seller the absolute value of the payment amount determined by the above formula.

- (f) The differential amount is discounted at post change (actual) interest rate as it is settled at the beginning of the period, not at the end.

Happy Learning