QUESTION NO. 23A ***(Exam Question)(5 Marks)*** A trader is having in its portfolio shares worth ₹ 85 lakhs at current price and cash ₹15 lakhs.The beta of share portfolio is 1.6.After 3 months the price of shares dropped by 3.2%. **Determine: (i)**Current portfolio beta. **(ii)**Portfolio beta after 3 months if the trader on current date goes for long position on ₹ 100 lakhs Nifty futures.

Solution:

Current Portfolio Beta

Current Beta for share = 1.6; Beta for cash = 0; Current portfolio beta = 0.85 x 1.6 + 0 x 0.15 = 1.36

Portfolio beta after 3 months: Beta for portfolio of shares = Change in value of portfolio of share / Change in value of market portfolio (Index) or 1.6 = 0.032 / Change in value of market portfolio (Index)

Change in value of market portfolio (Index) = (0.032/1.6) x 100 = 2%

Position taken on 100 lakh Nifty futures: Long

Value of index after 3 months = ₹ 100 lakh x (100 - 0.02) = ₹ 98 lakh ; Mark-to-market paid = ₹ 2 lakh

Cash balance after payment of mark-to-market = ₹ 13 lakh

Value of portfolio after 3 months = ₹85 lakh x (1 - 0.032) + ₹13 lakh = ₹95.28 lakh

Change in value of portfolio = 100 lakh - 95.28 lakh/ 100 lakh = 4.72%; Portfolio beta = 0.0472/0.02 = 2.36

DECREASE IN PORTFOLIO BETA BY DISPOSING OFF A PART OF EXISTING PORTFOLIO TO ACQUIRE RISK FREE SECURITIES

QUESTION NO.29A Details about portfolio of shares of an investor is as below:

Shares	No. of shares (lakh)	Price per share	Beta
A Ltd.	3.00	₹ 500	1.40
B Ltd.	4.00	₹ 750	1.20
C Ltd.	2.00	₹ 250	1.60

The investor thinks that the risk of portfolio is very high and wants to reduce the portfolio beta to 0.91. **He is considering two below mentioned alternative strategies:**

(i) Dispose off a part of his existing portfolio to acquire risk free securities, or

(ii) Take appropriate position on Nifty Futures which are currently traded at ₹8125 and each Nifty points is 200(Lot Size). **You are required to determine**:

(1)portfolio beta, **(2)**the value of risk free securities to be acquired,

(3)the number of shares of each company to be disposed off, **(4)**the number of Nifty contracts to be bought/sold;

(5)the value of portfolio beta for 2% rise in Nifty.

Solution: (₹ lakhs)

Shares	No. of shares	MPS	MV	Weight	Beta	WeightxBeta
A Ltd.	3.00	500.00	1500.00	0.30	1.40	0.42
B Ltd.	4.00	750.00	3000.00	0.60	1.20	0.72
C Ltd.	2.00	250.00	500.00	0.10	1.60	0.16
			5000.00	1.00		1.30
(1)Portfolio beta						1.30
(2)Required Beta						0.91

Let the proportion of risk free securities for target beta: 0.91 = 0 x p + 1.30(1- p) or p = 0.30 i.e. 30%

Value Of Risk Free Securities to be Acquired = 5000 * 30% = ₹1,500 lakh

(3) Number of shares of each company to be disposed off

Shares	Weight	Proportionate	MPS	No. of Shares (Lakh)

		Amount		
A Ltd.	0.30	450.00	500.00	0.90
B Ltd.	0.60	900.00	750.00	1.20
C Ltd.	0.10	150.00	250.00	0.60

(4)Number of Nifty Contract to be sold: $\frac{(1.30-.91)\times 5000\text{Lakhs}}{8{,}125\times 200}$ = 120 contracts

(5)2% rises in Nifty is accompanied by 2% x 1.30 i.e. 2.6% rise for portfolio of shares:	**₹ Lakh**
Current Value of Portfolio of Shares	5000
Value of Portfolio after rise	5130
Mark-to-Market Margin paid or loss paid	
(8125 x 0.020 x ₹ 200 x 120)	39
Net Value of the portfolio (after rise of Nifty) Loss	5091
% change in value of portfolio (5091 - 5000)/ 5000	1.82%
% rise in the value of Nifty	2%
Beta	0.91

WHEN INITIAL MARGIN AMOUNT IS NOT DIRECTLY GIVEN

QUESTION NO.31*(Exam Question)(8 Marks)* Sensex futures are traded at a multiple of 50. **Consider the following quotations of Sensex futures in the 10 trading days during February, 2009:**

Day	High	Low	Closing
4-2-09	3306.4	3290.00	3296.50
5-2-09	3298.00	3262.50	3294.40
6-2-09	3256.20	3227.00	3230.40
7-2-09	3233.00	3201.50	3212.30
10-2-09	3281.50	3256.00	3267.50
11-2-09	3283.50	3260.00	3263.80
12-2-09	3315.00	3286.30	3292.00
14-2-09	3315.00	3257.10	3309.30
17-2-09	3278.00	3249.50	3257.80
18-2-09	3118.00	3091.40	3102.60

Abshishek bought/purchased one sensex futures contract on February ,04 at closing rate. The average daily absolute change in the value of contract is ₹ 10,000 and standard deviation of these changes is ₹2,000. the maintenance margin is 75% of initial margin. **You are required to determine** the daily balances in the margin account and payment on margin calls.

Hint: Initial Margin should be calculated by using Daily Absolute Changes + 3 x SD

Hint:Give preference to closing figure for Margin calculations.

Solution:

Initial Margin = μ + 3 s Where μ = Daily Absolute Changes and s = Standard Deviation

Accordingly Initial Margin = ₹ 10,000 + ₹ 3 x 2,000 = ₹ 16,000; Maintenance margin = ₹ 16,000 x 0.75 = ₹ 12,000

Lot Size = 50 (Given); Contract Rate = ₹ 3296.50

Abhishek taken Long Position

Day	Opening Price	Closing Price	MTM	Margin Call	Closing Balance
4	-	3296.50	-	-	16,000
5	3296.50	3294.4	-105	-	15,895

6	3294.4	3230.4	-3200	-	12,695
7	3230.4	3212.3	-905	4210	16,000
10	3212.3	3267.5	2760	-	18,760
11	3267.5	3263.8	-185	-	18,575
12	3263.8	3292	1410	-	19,985
14	3292	3309.3	865	-	20,850
17	3309.3	3257.8	-2575	-	18,275
18	3257.8	3102.6	-7760	5485	16,000

MEANING OF CONTANGO/ BACKWARDATION

QUESTION NO.36 Mr. SG sold five 4-Month Nifty Futures on 1st February 2020 for ₹ 9,00,000. At the time of closing of trading on the last Thursday of May 2020 (expiry), Index turned out to be 2100. The contract multiplier is 75. **Based on the above information calculate: (i)**The price of one Future Contract on 1st February 2020. **(ii)**Approximate Nifty Sensex on 1st February 2020 if the Price of Future Contract on same date was theoretically correct. On the same day Risk Free Rate of Interest and Dividend Yield on Index was 9% and 6% p.a. respectively. **(iii)**The maximum Contango/ Backwardation. **(iv)**The pay-off of the transaction.

Note: Carry out calculation on month basis.

Solution:

(i)The price of one Future Contract :

Let X be the Price of Future Contract. Accordingly, $5 = \frac{9,00,000}{X}$ or X (Price of One Future Contract) = ₹ 1,80,000

(ii)Current Future price of the index $= \frac{1,80,000}{75}$

Let Y be the current Nifty Index (on 1st February 2020) then Accordingly, $Y + Y (0.09 - 0.06) \frac{4}{12} = 2400$

and $Y = \frac{2400}{1.01} = 2376.24$

Hence Nifty Index on 1st February 2020 shall be approximately 2376.

(iii)To determine whether the market is in Contango/ Backwardation first we shall compute Basis as follows:

Basis = Spot Price – Future Price

If Basis is negative the market is said to be in Contango and when it is positive the market is said to be Backwardation.

Since current Spot Price is 2400 and Nifty Index is 2376, the Basis is negative and hence there is Contango Market and maximum Contango shall be 24 (2400 - 2376).

(iv)Pay off on the Future transaction shall be [(2400-2100) x 375] ₹ 112500

The Future seller gains if the Spot Price is less than Futures Contract price as position shall be reversed at same Spot price. Therefore, Mr. SG has gained ₹ 1,12,500/- on the Short position taken.

STOCK LENDING SCHEME

QUESTION NO.38 Mr. A is holding 1000 shares of face value of Rs. 100 each of M/s. ABC Ltd. He wants to hold these shares for long term and have no intention to sell.

On 1st January 2020, M/s XYZ Ltd. Has made short sales of M/s. ABC Ltd.'s shares and approached Mr. A to lend his shares under Stock Lending Scheme with following terms:

(i) Shares to be borrowed for 3 months from 01-01-2020 to 31-03-2020,

(ii) Lending Charges/Fees of 1% to be paid every month on the closing price of the stock quoted in Stock Exchange and

(iii) Bank Guarantee will be provided as collateral for the value as on 01 -01-2020.

Other Information:

(a) Cost of Bank Guarantee is 8% per annum,

(b)On 29-02-2020 M/s. ABC Ltd.'s share quoted in Stock Exchange on various dates are as follows:

Date	Share Price in Scenario -1 Bullish	Share Price in Scenario -2 Bullish
01-01-2020	1000	1000
31-01-2020	1020	980
29-02-2020	1040	960
31-03-2020	1050	940

(c) Dividend Income Per Share is Rs.25 **OR** On 29-02-2020 M/s. ABC Ltd., declared dividend of 25%.

You are required to find out:

(i) Earning of Mr. A through **Stock Lending Scheme** in both the scenarios,

(ii) Total Earnings of Mr. A during 01-01-2020 to 31-03-2020 in both the scenarios,

(iii) What is the Profit or loss to M/s. XYZ by shorting the shares using through Stock Lending Scheme in both the scenarios?

Solution:

	Scenario 1	Scenario 2
(i)Earnings of Mr. A through stock lending scheme		
Lending fee		
31-01-20 1020 x 1% and 980 x 1%	10.20	9.80
29-02-20 1040 x 1% and 960 x 1%	10.40	9.60
31-03-20 1050 x 1% and 940 x 1%	10.50	9.40
Earnings from lending per Share (A)	31.10	28.80
Total No. of Shares	1000	1000
Total Earning from Lending	31,100	28,800
(ii)Total Earnings of Mr. A during 01-01-2020 to 31-01-2020		
Dividend income per Share (B)	25.00	25.00
Total earnings per share (A) + (B)	56.10	53.80
Total No. of Shares	1000	1000
Total Earning	56,100	53,800
(iii)Profit or loss to M/s. XYZ		
Gain on shortening the shares		
(1,000 – 1,050) and (1,000 - 940)	(50.00)	60.00
Lending fees paid	(31.10)	(28.80)
Bank guarantee charges @ 8%	(20.00)	(20.00)
Gain Per Share	(101.10)	11.20
Total No. of Shares	1000	1000
Total Gain on shortening the shares	(1,01,100)	11,200