

PAPER – 2 : STRATEGIC FINANCIAL MANAGEMENT

Question No.1 is compulsory.

Answer any **five** questions from the remaining six questions.

Working notes should form part of the answer.

Question 1

- (a) A bank enters into a forward purchase TT covering an export bill for Swiss Francs 1,00,000 at ₹ 32.4000 due 25th April and covered itself for same delivery in the local inter bank market at ₹ 32.4200. However, on 25th March, exporter sought for cancellation of the contract as the tenor of the bill is changed.

In Singapore market, Swiss Francs were quoted against dollars as under:

Spot	USD 1 = Sw. Fcs. 1.5076/1.5120
One month forward	1.5150/ 1.5160
Two months forward	1.5250 / 1.5270
Three months forward	1.5415/ 1.5445

and in the interbank market US dollars were quoted as under:

Spot	USD 1 = ₹ 49.4302/.4455
Spot / April	.4100/.4200
Spot/May	.4300/.4400
Spot/June	.4500/.4600

Calculate the cancellation charges, payable by the customer if exchange margin required by the bank is 0.10% on buying and selling. (5 Marks)

- (b) The following data is available for a bond:

Face Value	₹ 1,000
Coupon Rate	11%
Years to Maturity	6
Redemption Value	₹ 1,000
Yield to Maturity	15%

(Round-off your answers to 3 decimals)

Calculate the following in respect of the bond:

- (i) Current Market Price.
- (ii) Duration of the Bond.
- (iii) Volatility of the Bond.

- (iv) Expected market price if increase in required yield is by 100 basis points.
- (v) Expected market price if decrease in required yield is by 75 basis points. (5 Marks)
- (c) Mr. Dayal is interested in purchasing equity shares of ABC Ltd. which are currently selling at ₹ 600 each. He expects that price of share may go upto ₹ 780 or may go down to ₹ 480 in three months. The chances of occurring such variations are 60% and 40% respectively. A call option on the shares of ABC Ltd. can be exercised at the end of three months with a strike price of ₹ 630.
- (i) What combination of share and option should Mr. Dayal select if he wants a perfect hedge?
- (ii) What should be the value of option today (the risk free rate is 10% p.a.)?
- (iii) What is the expected rate of return on the option? (5 Marks)
- (d) XYZ, an Indian firm, will need to pay JAPANESE YEN (JY) 5,00,000 on 30th June. In order to hedge the risk involved in foreign currency transaction, the firm is considering two alternative methods i.e. forward market cover and currency option contract.

On 1st April, following quotations (JY/INR) are made available:

Spot	3 months forward
1.9516/1.9711.	1.9726./1.9923

The prices for forex currency option on purchase are as follows:

Strike Price	JY 2.125
Call option (June)	JY 0.047
Put option (June)	JY 0.098

For excess or balance of JY covered, the firm would use forward rate as future spot rate.

You are required to recommend cheaper hedging alternative for XYZ. (5 Marks)

Answer

1. (a) First the contract will be cancelled at TT Selling Rate

USD/ Rupee Spot Selling Rate	₹ 49.4455	
Add: Premium for April	₹ 0.4200	
	₹ 49.8655	
Add: Exchange Margin @ 0.10%	₹ 0.04987	
	₹ 49.91537	Or 49.9154
USD/ Sw. Fcs One Month Buying Rate	Sw. Fcs. 1.5150	
Sw. Fcs. Spot Selling Rate (₹49.91537/1.5150)	₹ 32.9474	
Rounded Off	₹ 32.9475	

Bank buys Sw. Fcs. Under original contract	₹ 32.4000
Bank Sells under Cancellation	₹ 32.9475
Difference payable by customer	₹ 00.5475
Exchange difference of Sw. Fcs. 1,00,000 payable by customer	₹ 54,750
(Sw. Fcs. 1,00,000 x ₹ 0.5475)	

(b) (i) Calculation of Market price:

$$TM = \frac{\text{Coupon interest} + \left(\frac{\text{Discount or premium}}{\text{Years left}} \right)}{\frac{\text{Face Value} + \text{Market value}}{2}}$$

Discount or premium – YTM is more than coupon rate, market price is less than Face Value i.e. at discount.

Let x be the market price

$$0.15 = \frac{110 + \left\{ \frac{(1,000 - x)}{6} \right\}}{\frac{1,000 + x}{2}}$$

$$x = ₹ 834.48$$

(ii) Duration

Year	Cash flow	P.V. @ 15%		Proportion of bond value	Proportion of bond value x time (years)
1	110	.870	95.70	0.113	0.113
2	110	.756	83.16	0.098	0.196
3	110	.658	72.38	0.085	0.255
4	110	.572	62.92	0.074	0.296
5	110	.497	54.67	0.064	0.320
6	1110	.432	<u>479.52</u>	<u>0.565</u>	<u>3.39</u>
			<u>848.35</u>	<u>1.000</u>	<u>4.570</u>

Duration of the Bond is 4.570 years

(iii) Volatility

$$\text{Volatility of the bond} = \frac{\text{Duration}}{(1 + \text{yields})} = \frac{4.570}{1.15} = 3.974$$

(iv) The expected market price if increase in required yield is by 100 basis points.

$$= ₹ 834.48 \times 1.00 (3.974/100) = ₹ 33.162$$

$$\text{Hence expected market price is } ₹ 834.48 - ₹ 33.162 = ₹ 801.318$$

Hence, the market price will decrease

(v) The expected market price if decrease in required yield is by 75 basis points.

$$= ₹ 834.48 \times 0.75 (3.974/100) = ₹ 24.87$$

$$\text{Hence expected market price is } ₹ 834.48 + ₹ 24.87 = ₹ 859.35$$

Hence, the market price will increase

(c) (i) To compute perfect hedge we shall compute Hedge Ratio (Δ) as follows:

$$\Delta = \frac{C_1 - C_2}{S_1 - S_2} = \frac{150 - 0}{780 - 480} = \frac{150}{300} = 0.50$$

Mr. Dayal should purchase 0.50 share for every 1 call option.

(ii) Value of Option today

If price of share comes out to be ₹780 then value of purchased share will be:

Sale Proceeds of Investment (0.50 x ₹ 780)	₹ 390
Loss on account of Short Position (₹ 780 – ₹ 630)	₹ 150
	₹ 240

If price of share comes out to be ₹ 480 then value of purchased share will be:

Sale Proceeds of Investment (0.50 x ₹ 480)	₹ 240
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Accordingly Premium say P shall be computed as follows:

$$(\₹ 300 - P) 1.025 = ₹ 240$$

$$P = ₹ 65.85$$

(iii) Expected Return on the Option

$$\text{Expected Option Value} = (\₹ 780 - ₹ 630) \times 0.60 + ₹ 0 \times 0.40 = ₹ 90$$

$$\text{Expected Rate of Return} = \frac{90 - 65.85}{65.85} \times 100 = 36.67\%$$

(d) (i) Forward Cover

$$3 \text{ month Forward Rate} = \frac{1}{1.9726} = ₹ 0.5070/\text{JY}$$

Accordingly INR required for JY 5,00,000 (5,00,000 X ₹ 0.5070) ₹ 2,53,500

(ii) Option Cover

To purchase JY 5,00,000, XYZ shall enter into a Put Option @ JY 2.125/INR

$$\text{Accordingly, outflow in INR} \left(\frac{\text{JY } 5,00,000}{2.125} \right) \quad ₹ 2,35,294$$

$$\text{Premium} \left(\frac{\text{INR } 2,35,294 \times 0.098}{1.9516} \right) \quad ₹ 11,815$$

₹ 2,47,109

Since outflow of cash is least in case of Option same should be opted for. Further if price of INR goes above JY 2.125/INR the outflow shall further be reduced.

Question 2

- (a) The following information is provided relating to the acquiring company E Ltd., and the target company H Ltd:

Particulars	E Ltd. (₹)	H Ltd. (₹)
Number of shares (Face value ₹ 10 each)	20 Lakhs	15 Lakhs
Market Capitalization	1000 Lakhs	1500 Lakhs
P/E Ratio (times)	10.00	5.00
Reserves and surplus in ₹	600.00 Lakhs	330.00 Lakhs
Promoter's Holding (No. of shares)	9.50 Lakhs	10.00 Lakhs

The Board of Directors of both the companies have decided to give a fair deal to the shareholders. Accordingly, the weights are decided as 40%, 25% and 35% respectively for earnings, book value and market price of share of each company for swap ratio.

Calculate the following:

- Market price per share, earnings per share and Book Value per share;
- Swap ratio;
- Promoter's holding percentage after acquisition;
- EPS of E Ltd. after acquisitions of H Ltd;

- (v) Expected market price per share and market capitalization of E Ltd.; after acquisition, assuming P/E ratio of E Ltd. remains unchanged; and
- (vi) Free float market capitalization of the merged firm. (10 Marks)
- (b) Mr. A will need ₹ 1,00,000 after two years for which he wants to make one time necessary investment now. He has a choice of two types of bonds. Their details are as below:

	Bond X	Bond Y
Face value	₹ 1,000	₹ 1,000
Coupon	7% payable annually	8% payable annually
Years to maturity	1	4
Current price	₹ 972.73	₹ 936.52
Current yield	10%	10%

Advice Mr. A whether he should invest all his money in one type of bond or he should buy both the bonds and, if so, in which quantity? Assume that there will not be any call risk or default risk. (6 Marks)

Answer

2. (a)

(i)	E Ltd.	H Ltd.
Market capitalisation	1000 lakhs	1500 lakhs
No. of shares	20 lakhs	15 lakhs
Market Price per share	₹ 50	₹ 100
P/E ratio	10	5
EPS	₹ 5	₹ 20
Profit	₹ 100 lakh	₹ 300 lakh
Share capital	₹ 200 lakh	₹ 150 lakh
Reserves and surplus	<u>₹ 600 lakh</u>	<u>₹ 330 lakh</u>
Total	<u>₹ 800 lakh</u>	<u>₹ 480 lakh</u>
Book Value per share	₹ 40	₹ 32

(ii) Calculation of Swap Ratio

EPS	1 : 4 i.e.	4.0 × 40%	1.6
Book value	1 : 0.8 i.e.	0.8 × 25%	0.2
Market price	1 : 2 i.e.	2.0 × 35%	<u>0.7</u>
		Total	<u>2.5</u>

Swap ratio is for every one share of H Ltd., to issue 2.5 shares of E Ltd.
Hence, total no. of shares to be issued $15 \text{ lakh} \times 2.5 = 37.50 \text{ lakh shares}$

(iii) Promoter's holding = $9.50 \text{ lakh shares} + (10 \times 2.5 = 25 \text{ lakh shares}) = 34.50 \text{ lakh}$ i.e. Promoter's holding % is $(34.50 \text{ lakh} / 57.50 \text{ lakh}) \times 100 = 60\%$.

(iv) Calculation of EPS after merger

Total No. of shares $20 \text{ lakh} + 37.50 \text{ lakh} = 57.50 \text{ lakh}$

$$\text{EPS} \frac{\text{Total profit}}{\text{No. of shares}} = \frac{100 \text{ lakh} + 300 \text{ lakh}}{57.50 \text{ lakh}} = \frac{400}{57.50} = ₹ 6.956$$

(v) Calculation of Market price and Market capitalization after merger

Expected market price $\text{EPS } 6.956 \times \text{P/E } 10 = ₹ 69.56$

Market capitalization $= ₹ 69.56 \text{ per share} \times 57.50 \text{ lakh shares}$
 $= ₹ 3,999.70 \text{ lakh or } ₹ 4,000 \text{ lakh}$

(vi) Free float of market capitalization $= ₹ 69.56 \text{ per share} \times (57.50 \text{ lakh} \times 40\%)$
 $= ₹ 1599.88 \text{ lakh}$

(b) Duration of Bond X

Year	Cash flow	P.V. @ 10%		Proportion of bond value	Proportion of bond value x time (years)
1	1070	.909	972.63	1.000	1.000

Duration of the Bond is 1 year

Duration of Bond Y

Year	Cash flow	P.V. @ 10%		Proportion of bond value	Proportion of bond value x time (years)
1	80	.909	72.72	0.077	0.077
2	80	.826	66.08	0.071	0.142
3	80	.751	60.08	0.064	0.192
4	1080	.683	<u>737.64</u>	<u>0.788</u>	<u>3.152</u>
			<u>936.52</u>	<u>1.000</u>	<u>3.563</u>

Duration of the Bond is 3.563 years

Let x_1 be the investment in Bond X and therefore investment in Bond Y shall be $(1 - x_1)$. Since the required duration is 2 year the proportion of investment in each of these two securities shall be computed as follows:

$$2 = x_1 + (1 - x_1) 3.563$$

$$x_1 = 0.61$$

Accordingly, the proportion of investment shall be 61% in Bond X and 39% in Bond Y respectively.

Amount of investment

Bond X	Bond Y
PV of ₹ 1,00,000 for 2 years @ 10% x 61%	PV of ₹ 1,00,000 for 2 years @ 10% x 39%
= ₹ 1,00,000 (0.826) x 61%	= ₹ 1,00,000 (0.826) x 39%
= ₹ 50,386	= ₹ 32,214
No. of Bonds to be purchased	No. of Bonds to be purchased
= ₹ 50,386/₹ 972.73 = 51.79 i.e. approx. 52 bonds	= ₹ 32,214/₹ 936.52 = 34.40 i.e. approx. 34 bonds

Note : The investor has to keep the money invested for two years. Therefore, the investor can invest in both the bonds with the assumption that Bond X will be reinvested for another one year on same returns.

Question 3

- (a) On April 1, 2015, an investor has a portfolio consisting of eight securities as shown below:

Security	Market Price	No. of Shares	Value
A	29.40	400	0.59
B	318.70	800	1.32
C	660.20	150	0.87
D	5.20	300	0.35
E	281.90	400	1.16
F	275.40	750	1.24
G	514.60	300	1.05
H	170.50	900	0.76

The cost of capital for the investor is 20% p.a. continuously compounded. The investor fears a fall in the prices of the shares in the near future. Accordingly, he approaches you for the advice to protect the interest of his portfolio.

You can make use of the following information:

- (i) The current NIFTY value is 8500.
- (ii) NIFTY futures can be traded in units of 25 only.
- (iii) Futures for May are currently quoted at 8700 and Futures for June are being quoted at 8850.

You are required to calculate:

- (i) the beta of his portfolio.
- (ii) the theoretical value of the futures contract for contracts expiring in May and June.

Given ($e^{0.03}=1.03045$, $e^{0.04}=1.04081$, $e^{0.05}=1.05127$)

- (iii) the number of NIFTY contracts that he would have to sell if he desires to hedge until June in each of the following cases:

- (A) His total portfolio
- (B) 50% of his portfolio
- (C) 120% of his portfolio

(8 Marks)

- (b) The Finance manager of ABC Corporation is analyzing firms policy regarding computers which are now being leased on yearly basis on rental amounting to ₹1,00,000 per year. The computers can be bought for ₹5,00,000. The purchase would be financed by 16% and the loan is repayable in 4 equal annual installments.

On account of rapid technological progress in the computer industry, it is suggested that a 4-year economic life should be used instead of a 10-year physical life. It is estimated that the computers would be sold for ₹2,00,000 at the end of 4 years.

The company uses the straight line method of depreciation. Corporate tax rate is 35%.

- (i) Whether the equipment be bought or be taken on lease?
- (ii) Analyze the financial viability from the point of view of the lessor, assuming 14% cost of capital.
- (iii) Determine the minimum lease rent at which lessor would break even.

(8 Marks)

Answer**3. (a) (i) Beta of the Portfolio**

Security	Market Price	No. of Shares	Value	β	Value x β
A	29.40	400	11760	0.59	6938.40
B	318.70	800	254960	1.32	336547.20
C	660.20	150	99030	0.87	86156.10
D	5.20	300	1560	0.35	546.00
E	281.90	400	112760	1.16	130801.60
F	275.40	750	206550	1.24	256122.00
G	514.60	300	154380	1.05	162099.00
H	170.50	900	153450	0.76	116622.00
			994450		1095832.30

$$\text{Portfolio Beta} = \frac{10,95,832.30}{9,94,450} = 1.102$$

(ii) Theoretical Value of Future Contract Expiring in May and June

$$F = Se^{rt}$$

$$F_{\text{May}} = 8500 \times e^{0.20 \times (2/12)} = 8500 \times e^{0.0333}$$

$e^{0.0333}$ shall be computed using Interpolation Formula as follows:

$e^{0.03}$	= 1.03045
$e^{0.04}$	= 1.04081
$e^{0.01}$	= 0.01036
$e^{0.0033}$	= 0.00342
$e^{0.0067}$	= 0.00694

$$e^{0.0333} = 1.03045 + 0.00342 = 1.03387 \text{ or } 1.04081 - 0.00694 = 1.03387$$

According the price of the May Contract

$$8500 \times 1.03387 = ₹ 8788$$

Price of the June Contract

$$F_{\text{May}} = 8500 \times e^{0.20 \times (3/12)} = 8500 \times e^{0.05} = 8500 \times 1.05127 = 8935.80$$

(iii) No. of NIFTY Contracts required to sell to hedge until June

$$= \frac{\text{Value of Position to be hedged}}{\text{Value of Future Contract}} \times \beta$$

(A) Total portfolio

$$\frac{994450}{8850 \times 25} \times 1.102 = 4.953 \text{ say 5 contracts}$$

(B) 50% of Portfolio

$$\frac{994450 \times 0.50}{8850 \times 25} \times 1.102 = 2.47 \text{ say 3 contracts}$$

(C) 120% of Portfolio

$$\frac{994450 \times 1.20}{8850 \times 25} \times 1.102 = 5.94 \text{ say 6 contracts}$$

- (b) (i) The loan amount is repayable together with the interest at the rate of 16% on loan amount and is repayable in equal installments at the end of each year. The PVAF at the rate of 16% for 4 years is 2.798, the amount payable will be

$$\text{Annual Payment} = \frac{\text{₹ } 5,00,000}{2.798} = \text{₹ } 1,78,699 \text{ (rounded)}$$

Schedule of Debt Repayment

End of Year	Total Principal ₹	Interest ₹	Principal ₹	Principal Amount Outstanding ₹
1	5,00,000	80,000	98,699	4,01,301
2	4,01,301	64,208	1,14,491	2,86,810
3	2,86,810	45,890	1,32,809	1,54,001
4	1,54,001	24,698*	1,54,001	-----

* Balancing Figure

Tax Benefit on Interest and Depreciation

Year	Interest	Depreciation	Total	Tax Benefit
1	80,000	75,000	1,55,000	54,250
2	64,208	75,000	1,39,208	48,723
3	45,890	75,000	1,20,890	42,312
4	24,698	75,000	99,698	34,894

Present Value of Cash Flows under Borrow and Buying proposal

Year	Installment ₹	Salvage Value (₹)	Tax Benefit (₹)	Net Flow (₹)	PVF @ 10.4%	PV (₹)
1	1,78,699		54,250	1,24,449	0.906	1,12,751
2	1,78,699		48,723	1,29,976	0.820	1,06,580
3	1,78,699		42,312	1,36,387	0.743	1,01,336
4	1,78,699	(2,00,000)	34,894	-56,195	0.673	-37,819
					3.142	2,82,848

Present Value of Cash Flows under Leasing Option

$$₹ 1,00,000 (1 - 0.35) \times 3.142 = ₹ 2,04,230$$

Hence leasing should be preferred as cash flow is least in this option.

(ii) Analyzing financial viability from Lessor's point of view

(a) Determination of Cash Flow after Tax

	₹
Annual Rent	1,00,000
Less: Depreciation	75,000
EBT	25,000
Less: Tax @ 35%	8,750
Profit after Tax	16,250
Add: Depreciation	75,000
	91,250

(b) Computation of Net Present Value

	₹
Present Value of Cash inflow (₹ 91,250 x 2.914)	2,65,903
Add: PV of Salvage Value (₹ 2,00,000 x 0.592)	1,18,400
	3,84,303
Purchase Price	(5,00,000)
NPV	(1,15,697)

Thus proposal is not financially viable from lessor's point of view.

(iii) Break Even Lease Rent

	₹
Cost of Computer	5,00,000

Less: PV of Salvage Value (₹ 2,00,000 x 0.592)	1,18,400
	3,81,600
PVIAF (14%,4)	2.914
CFAT Desired	1,30,954
Less: Depreciation	75,000
EAT	55,954
Add: Taxes	30,129
EBT	86,083
Add: Depreciation	75,000
Lease Rental (Desired)	1,61,083

Question 4

- (a) XYZ Ltd., a company based in India, manufactures very high quality modern furniture and sells to a small number of retail outlets in India and Nepal. It is facing tough competition. Recent studies on marketability of products have clearly indicated that the customer is now more interested in variety and choice rather than exclusivity and exceptional quality. Since the cost of quality wood in India is very high, the company is reviewing the proposal for import of woods in bulk from Nepalese supplier.

The estimate of net Indian (₹) and Nepalese Currency (NC) cash flows for this proposal is shown below:

	Net Cash Flow (in millions)			
Year	0	1	2	3
NC	-25.000	2.600	3.800	4.100
Indian (₹)	0	2.869	4.200	4.600

The following information is relevant:

- XYZ Ltd. evaluates all investments by using a discount rate of 9% p.a. All Nepalese customers are invoiced in NC. NC cash flows are converted to Indian (₹) at the forward rate and discounted at the Indian rate.
- Inflation rates in Nepal and India are expected to be 9% and 8% p.a. respectively. The current exchange rate is ₹1 = NC 1.6

Assuming that you are the finance manager of XYZ Ltd., calculate the net present value (NPV) and modified internal rate of return (MIRR) of the proposal.

You may use following values with respect to discount factor for ₹1 @9%.

	Present Value	Future Value
Year 1	0.917	1.188

Year 2	0.842	1.090
Year 3	0.772	1

(8 Marks)

- (b) Mr. X on 1.7.2012, during the initial public offer of a Mutual Fund (MF) invested ₹ 1,00,000 at Face Value of ₹ 10. On 31.3.2013, the MF declared a dividend of 10% when Mr. X calculated that his holding period return was 115%. On 31.3.2014, MF again declared a dividend of 20%. On 31.3.2015, Mr. X redeemed all his investment which had accumulated to 11,296.11 units when his holding period return was 202.17%.

Calculate the NAVs as on 31.03.2013, 31.03.2014 and 31.03.2015.

(8 Marks)

Answer**4. (a) Working Notes:**

- (i) Computation of Forward Rates

End of Year	NC	NC/₹
1	$NC1.60 \times \left(\frac{(1+0.09)}{(1+0.08)} \right)$	1.615
2	$NC1.615 \times \left(\frac{(1+0.09)}{(1+0.08)} \right)$	1.630
3	$NC1.630 \times \left(\frac{(1+0.09)}{(1+0.08)} \right)$	1.645

- (ii) NC Cash Flows converted in Indian Rupees

Year	NC (Million)	Conversion Rate	₹ (Million)
0	-25.00	1.600	-15.625
1	2.60	1.615	1.61
2	3.80	1.630	2.33
3	4.10	1.645	2.49

Net Present Value

(₹ Million)

Year	Cash Flow in India	Cash Flow in Nepal	Total	PVF @ 9%	PV
0	---	-15.625	-15.625	1.000	-15.625

1	2.869	1.61	4.479	0.917	4.107
2	4.200	2.33	6.53	0.842	5.498
3	4.600	2.49	7.09	0.772	5.473
					-0.547

Modified Internal Rate of Return

	Year			
	0	1	2	3
Cash Flow (₹ Million)	-15.625	4.479	6.53	7.09
Year 1 Cash Inflow reinvested for 2 years (1.188 x 4.479)				5.32
Year 2 Cash Inflow reinvested for 1 years (1.090 x 6.53)				7.12
				19.53

$$\text{MIRR} = \sqrt[n]{\frac{\text{Terminal Cash Flow}}{\text{Initial Outlay}}} - 1 = \sqrt[3]{\frac{19.53}{15.625}} - 1 = 0.0772 \text{ say } 7.72\%$$

(b) Yield for 9 months = 115%

Market value of Investments as on 31.03.2013 = 1,00,000/- + (1,00,000 x 115%)
= ₹ 2,15,000/-

Therefore, NAV as on 31.03.2013 = (2,15,000 - 10,000)/10,000 = ₹ 20.50

(NAV would stand reduced to the extent of dividend payout, being (₹100,000 x 10%) = ₹ 10,000)

Since dividend was reinvested by Mr. X, additional units acquired

$$= \frac{\text{₹ } 10,000}{\text{₹ } 20.50} = 487.80 \text{ units}$$

Therefore, units as on 31.03.2013 = 10,000 + 487.80 = 10,487.80

[Alternately, units as on 31.03.2013 = (2,15,000/20.50) = 10,487.80]

Dividend as on 31.03.2014 = 10,487.80 x 10 x 0.2 = ₹ 20,975.60

Let X be the NAV on 31.03.2014, then number of new units reinvested will be ₹ 20,975.60/X. Accordingly 11296.11 units shall consist of reinvested units and 10487.80 (as on 31.03.2013). Thus, by way of equation it can be shown as follows:

$$11296.11 = \frac{20975.60}{X} + 10487.80$$

Therefore, NAV as on 31.03.2014 = $20,975.60 / (11,296.11 - 10,487.80)$
= ₹ 25.95

NAV as on 31.03.2015 = ₹ 1,00,000 (1+2.0217)/11296.11
= ₹ 26.75

Question 5

- (a) ABC Ltd., a US Firm, will need £ 5,00,000 in 180 days. In this connection, the following information is available:

Spot Rate 1£ = \$ 2.00

180 days forward rate of £ as of today is \$ 1.96

Interest rates are as follows:

	US	UK
180 days deposit rate	5.0%	4.5%
180 days borrowing rate	5.5%	5.0%

A call option on £ that expires in 180 days has an exercise price of \$ 1.97 and a premium of \$ 0.04.

ABC Ltd. has forecasted the spot rates for 180 days as below:

Future rate	Probability
\$ 1.91	30%
\$ 1.95	50%
\$ 2.05	20%

Which of the following strategies would be cheaper to ABC Ltd.?

- (i) Forward Contract;
 - (ii) A money market hedge;
 - (iii) A call option contract; and
 - (iv) No hedging option (8 Marks)
- (b) On 1st April, an open ended scheme of mutual fund had 300 lakh units outstanding with Net Assets Value (NAV) of ₹ 18.75. At the end of April, it issued 6 lakh units at opening NAV plus 2% load, adjusted for dividend equalization. At the end of May, 3 Lakh units were repurchased at opening NAV less 2% exit load adjusted for dividend equalization. At the end of June, 70% of its available income was distributed.

In respect of April-June quarter, the following additional information are available:

	₹ in lakh
Portfolio value appreciation	425.47
Income of April	22.950
Income for May	34.425
Income for June	45.450

You are required to calculate

- (i) Income available for distribution;
- (ii) Issue price at the end of April;
- (iii) repurchase price at the end of May; and
- (iv) net asset value (NAV) as on 30th June.

(8 Marks)

Answer

5. (a) (i) Forward contract: Dollar needed in 180 days = £5,00,000 × \$ 1.96 = \$9,80,000/-
- (ii) Money market hedge: Borrow \$, convert to £, invest £, repay \$ loan in 180 days

Amount in £ to be invested = 5,00,000/1.045 = £4,78,469

Amount of \$ needed to convert into £ = £4,78,469 × \$2 = \$9,56,938

Interest and principal on \$ loan after 180 days = \$9,56,938 × 1.055 = \$10,09,570

- (iii) Call option:

Expected Spot rate in 180 days	Prem. /unit	Exercise Option	Total price per unit	Total price for £5,00,000 xi	Prob. Pi	pixi
1.91	0.04	No	1.95	9,75,000	0.30	2,92,500
1.95	0.04	No	1.99	9,95,000	0.50	4,97,500
2.05	0.04	Yes	2.01*	10,05,000	0.20	2,01,000
						9,91,000

* (\$1.97 + \$0.04)

Alternatively it can also be computed also

Expected Spot rate in 180 days	Prem. /unit	Exercise Option	Total price per unit	Total price for £5,00,000 xi	Prob. Pi	pixi
1.91	0.04	No	1.95	9,75,000	0.30	2,92,500

1.95	0.04	No	1.99	9,95,000	0.50	4,97,500
2.05	0.04	Yes	2.01*	10,05,000	0.20	2,01,000
						9,91,000
Add: Interest on Premium (\$20,000 x 5.5%)						1,100
						9,92,100

(iv) No hedge option:

<i>Expected Future spot rate</i>	<i>Dollar needed Xi</i>	<i>Prob. Pi</i>	<i>Pi xi</i>
1.91	9,55,000	0.30	2,86,500
1.95	9,75,000	0.50	4,87,500
2.05	10,25,000	0.20	2,05,000
			9,79,000

The probability distribution of outcomes for no hedge strategy appears to be most preferable because least number of \$ are needed under this option to arrange £5,00,000.

(b) Calculation of Income available for Distribution

	Units (Lakh)	Per Unit (₹)	Total (₹ In lakh)
Income from April	300	0.0765	22.9500
Add: Dividend equalization collected on issue	6	0.0765	0.4590
	306	0.0765	23.4090
Add: Income from May		0.1125	34.4250
	306	0.1890	57.8340
Less: Dividend equalization paid on repurchase	3	0.1890	(0.5670)
	303	0.1890	57.2670
Add: Income from June		0.1500	45.4500
	303	0.3390	102.7170
Less: Dividend Paid		0.2373	(71.9019)
	303	0.1017	30.8151

Calculation of Issue Price at the end of April

	₹
Opening NAV	18.750
Add: Entry Load 2% of ₹ 18.750	(0.375)
	19.125
Add: Dividend Equalization paid on Issue Price	0.0765
	19.2015

Calculation of Repurchase Price at the end of May

	₹
Opening NAV	18.750
Less: Exit Load 2% of ₹ 18.750	(0.375)
	18.375
Add: Dividend Equalization paid on Issue Price	0.1890
	18.564

Closing NAV

		₹ (Lakh)
Opening Net Asset Value (₹ 18.75 × 300)		5625.0000
Portfolio Value Appreciation		425.4700
Issue of Fresh Units (6 × 19.2015)		115.2090
Income Received (22.950 + 34.425 + 45.450)		102.8250
		6268.504
Less: Units repurchased (3 × 18.564)	-55.692	
Income Distributed	-71.9019	(-127.5939)
Closing Net Asset Value		6140.9101
Closing Units (300 + 6 – 3) lakh		303 lakh
∴ Closing NAV as on 30 th June		₹ 20.2670

Question 6

- (a) XYZ Ltd. wants to purchase ABC Ltd. by exchanging 0.7 of its share for each share of ABC Ltd. Relevant financial data are as follows:

Equity shares outstanding	10,00,000	4,00,000
EPS (₹)	40	28
Market price per share (₹)	250	160

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

(10 Marks)

- (b) X Ltd. is a Shoes manufacturing company. It is all equity financed and has a paid-up Capital of ₹ 10,00,000 (₹ 10 per share)

X Ltd. has hired Swastika consultants to analyse the future earnings. The report of Swastika consultants states as follows:

- (i) The earnings and dividend will grow at 25% for the next two years.
- (ii) Earnings are likely to grow at the rate of 10% from 3rd year and onwards.
- (iii) Further, if there is reduction in earnings growth, dividend payout ratio will increase to 50%.

The other data related to the company are as follows:

Year	EPS (₹)	Net Dividend per share (₹)	Share Price (₹)
2010	6.30	2.52	63.00
2011	7.00	2.80	46.00
2012	7.70	3.08	63.75
2013	8.40	3.36	68.75
2014	9.60	3.84	93.00

You may assume that the tax rate is 30% (not expected to change in future) and post tax cost of capital is 15%.

By using the Dividend Valuation Model, calculate

- (i) Expected Market Price per share
- (ii) P/E Ratio.

(6 Marks)

Answer

(a) Working Notes

(a)

	XYZ Ltd.	ABC Ltd.
Equity shares outstanding (Nos.)	10,00,000	4,00,000
EPS	₹ 40	₹ 28

Profit	₹ 400,00,000	₹ 112,00,000
PE Ratio	6.25	5.71
Market price per share	₹ 250	₹ 160

(b) EPS after merger

No. of shares to be issued (4,00,000 x 0.70)	2,80,000
Existing Equity shares outstanding	10,00,000
Equity shares outstanding after merger	12,80,000
Total Profit (₹ 400,00,000 + ₹ 112,00,000)	₹ 512,00,000
EPS	₹ 40

(i) Impact of merger on EPS of both the companies

	XYZ Ltd.	ABC Ltd.
EPS after Merger	₹ 40	₹ 28
EPS before Merger	₹ 40	₹ 28*
	Nil	Nil

* ₹ 40 x 0.70

(ii) Gain from the Merger if exchange ratio is 1: 1

No. of shares to be issued	4,00,000
Existing Equity shares outstanding	10,00,000
Equity shares outstanding after merger	14,00,000
Total Profit (₹ 400,00,000 + ₹ 112,00,000)	₹ 512,00,000
EPS	₹ 36.57
Market Price of Share (₹ 36.57 x 6.25)	₹ 228.56
Market Price of Share before Merger	₹ 160.00
Impact (Increase/ Gain)	₹ 68.56

(iii) Gain/ loss from the Merger to the shareholders of XYZ Ltd.

Market Price of Share	₹ 228.56
Market Price of Share before Merger	₹ 250.00
Loss from the merger (per share)	₹ 21.44

(iv) Maximum Exchange Ratio acceptable to XYZ Ltd. shareholders

	₹ Lakhs
Market Value of Merged Entity (₹ 228.57 x 1400000)	3199.98

Less: Value acceptable to shareholders of XYZ Ltd.	2500.00
Value of merged entity available to shareholders of ABC Ltd.	699.98
Market Price Per Share	250
No. of shares to be issued to the shareholders of ABC Ltd. (lakhs)	2.80

Thus maximum ratio of issue shall be 2.80 : 4.00 or 0.70 share of XYZ Ltd. for one share of ABC Ltd.

(b) (a) The formula for the Dividend valuation Model is

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

K_e = Cost of Capital

g = Growth rate

D_1 = Dividend at the end of year 1

On the basis of the information given, the following projection can be made:

Year	EPS (₹)	DPS (₹)	PVF @15%	PV of DPS (₹)
2015	12.00 (9.60 x 125%)	4.80 (3.84 x 125%)	0.870	4.176
2016	15.00 (12.00 x 125%)	6.00 (4.80 x 125%)	0.756	4.536
2017	16.50 (15.00 x 110%)	8.25* (50% of ₹16.50)	0.658	5.429
				<u>14.141</u>

*Payout Ratio changed to 50%.

After 2017, the perpetuity value assuming 10% constant annual growth is:

$$D_1 = ₹ 8.25 \times 110\% = ₹ 9.075$$

Therefore P_0 from the end of 2017

$$\frac{₹ 9.075}{0.15 - 0.10} = ₹ 181.50$$

This must be discounted back to the present value, using the 3 year discount factor after 15%.

	₹
Present Value of P_0 ($₹ 181.50 \times 0.658$)	119.43
Add: PV of Dividends 2015 to 2017	<u>14.14</u>
Expected Market Price of Share	<u>133.57</u>

Question 7

Write short notes on any **four** of the following:

- (a) Assumptions of Modigliani & Miller Hypothesis.
- (b) Define the following Greeks with respect to options:
 - (i) Delta
 - (ii) Gamma
 - (iii) Vega
 - (iv) Rho
- (c) Money Market Mutual Funds
- (d) Instruments of international finance
- (e) Forfaiting Vs Export factoring

(4 x 4 = 16 Marks)

Answer**(a) The Modigliani & Miller hypothesis is based on the following assumptions:**

- (i) The firm operates in perfect capital markets in which all investors are rational and information is freely available to all.
- (ii) There are no taxes. Alternatively, there are no differences in the tax rates applicable to capital gains and dividends.
- (iii) The firm has a fixed investment policy.
- (iv) There are no floatation or transaction costs.
- (v) Risk of uncertainty does not exist. Investors are able to forecast future prices and dividends with certainty, and
- (vi) one discount rate is appropriate for all securities and all time periods. Thus, $r = k = k_t$ for all t .

- (b) (i) Delta:** It is the degree to which an option price will move given a small change in the underlying stock price. For example, an option with a delta of 0.5 will move half a rupee for every full rupee movement in the underlying stock.

The delta is often called the hedge ratio i.e. if you have a portfolio short 'n' options (e.g. you have written n calls) then n multiplied by the delta gives you the number of shares (i.e. units of the underlying) you would need to create a riskless position -

i.e. a portfolio which would be worth the same whether the stock price rose by a very small amount or fell by a very small amount.

- (ii) **Gamma:** It measures how fast the delta changes for small changes in the underlying stock price i.e. the delta of the delta. If you are hedging a portfolio using the delta-hedge technique described under "Delta", then you will want to keep gamma as small as possible, the smaller it is the less often you will have to adjust the hedge to maintain a delta neutral position. If gamma is too large, a small change in stock price could wreck your hedge. Adjusting gamma, however, can be tricky and is generally done using options.
 - (iii) **Vega:** Sensitivity of option value to change in volatility. Vega indicates an absolute change in option value for a one percentage change in volatility.
 - (iv) **Rho:** The change in option price given a one percentage point change in the risk-free interest rate. It is sensitivity of option value to change in interest rate. Rho indicates the absolute change in option value for a one percent change in the interest rate.
- (c) An important part of financial market is Money market. It is a market for short-term money. It plays a crucial role in maintaining the equilibrium between the short-term demand and supply of money. Such schemes invest in safe highly liquid instruments included in commercial papers certificates of deposits and government securities.
- Accordingly, the Money Market Mutual Fund (MMMF) schemes generally provide high returns and highest safety to the ordinary investors. MMMF schemes are active players of the money market. They channelize the idle short funds, particularly of corporate world, to those who require such funds. This process helps those who have idle funds to earn some income without taking any risk and with surety that whenever they will need their funds, they will get (generally in maximum three hours of time) the same. Short-term/emergency requirements of various firms are met by such Mutual Funds. Participation of such Mutual Funds provides a boost to money market and help in controlling the volatility.
- (d) The various financial instruments dealt with in the international market are briefly described below:
1. **Euro Bonds:** A *Eurobond* is an international bond that is denominated in a currency not native to the country where it is issued. Also called external bond e.g. A Yen floated in Germany; a yen bond issued in France.
 2. **Foreign Bonds:** These are debt instruments denominated in a currency which is foreign to the borrower and is denominated in a currency that is native to the country where it is issued. A British firm placing \$ denominated bonds in USA is said to be selling foreign bonds.

3. **Fully Hedged Bonds:** In foreign bonds, the risk of currency fluctuations exists. Fully hedged bonds eliminate that risk by selling in forward markets the entire stream of interest and principal payments.
4. **Floating Rate Notes:** These are debt instruments issued upto 7 years maturity. Interest rates are adjusted to reflect the prevailing exchange rates. They provide cheaper money than fixed rate debt instruments; however, they suffer from inherent interest rate volatility risk.
5. **Euro Commercial Papers:** Euro Commercial Papers (ECPs) are short-term money market instruments. They are for maturities for less than a year. They are usually designated in US dollars.

(e) Major differences between Forfaiting and Factoring are as follows:

Factoring	Forfaiting
This may be with recourse or without recourse to the supplier.	This is without recourse to the exporter. The risks are borne by the forfeiter.
It usually involves trade receivables of short maturities.	It usually deals in trade receivables of medium and long term maturities.
It does not involve dealing in negotiable instruments.	It involves dealing in negotiable instrument like bill of exchange and promissory note.
The seller (client) bears the cost of factoring.	The overseas buyer bears the cost of forfaiting
Usually it involves purchase of all book debts or all classes of book debts.	Forfaiting is generally transaction or project based. Its structuring and costing is case to case basis.
Factoring tends to be a 'case of' sell of debt obligation to the factor, with no secondary market.	There exists a secondary market in forfaiting. This adds depth and liquidity to forfaiting.