

PAPER – 2 : MANAGEMENT ACCOUNTING AND FINANCIAL ANALYSIS

Question No. 1 is compulsory. Answer any four from the rest.

Figures in the margin indicate marks allotted to each question.

Working notes should form part of the answer.

Question 1

ABC Ltd. Sells computer services to its clients. The company has recently completed a feasibility study and decided to acquire an additional computer, the details of which are as follows:

- (1) The purchase price of the computer is Rs.2,30,000; maintenance, property taxes and insurance will be Rs.20,000 per year. The additional expenses to operate the computer are estimated at Rs.80,000. If the computer is rented from the owner, the annual rent will be Rs.85,000, plus 5% of annual billings. The rent is due on the last day of each year.
- (2) Due to competitive conditions, the company feels that it will be necessary to replace the computer at the end of three years with a more advanced model. Its resale value is estimated at Rs.1,10,000.
- (3) The corporate income tax rate is 50% and the straight line method of depreciation is followed.
- (4) The estimated annual billing for the services of the new computer will be Rs.2,20,000 during the first year, and Rs.2,60,000 during the subsequent two years.
- (5) If the computer is purchased, the company will borrow to finance the purchase from a bank with interest at 16% per annum. The interest will be paid regularly, and the principal will be returned in one lump sum at the end of the year 3.

Should the company purchase the computer or lease it? Assume (i) cost of capital as 12%, (ii) straight line method of depreciation, (iii) salvage value of Rs.1,10,000 and evaluate the proposal from the point of view of lessor also. (20 Marks)

Answer

Alternative 1

1. Evaluation of ABC Ltd's position under buying option considered.

Cost of Capital 12% as per question.

$$\text{Depreciation p.a.} = \frac{2,30,000 - 1,10,000}{3} = 40,000$$

Particulars	Y	E	A	R
	1	2	3	NPV
Recurrent Cash Flow				
Service Charges Receivable	2,20,000	2,60,000	2,60,000	
Tax, Insurance etc	(-)20,000	(-)20,000	(-)20,000	
Cost of operation	(-)80,000	(-)80,000	(-)80,000	

Depreciation	(-)40,000	(-)40,000	(-)40,000	
Interest on Loan @ 16%	(-)36,800	(-)36,800	(-)36,800	
Incremental PBT	43,200	83,200	83,200	
Corporate tax @ 50%	(-)21,600	(-)41,600	(-)41,600	
Incremental PAT	21,600	41,600	41,600	
Depreciation added back	40,000	40,000	40,000	
Incremental recurrent cash flow	61,600	81,600	81,600	
Terminal Cash Flow				
Repayment of Loan			(-)2,30,000	
Disposal of the computer			1,10,000	
Cash flows of buying option	61,600	81,600	38,400	
Discounting factors @ 12%	*0.893	*0.797	*0.712	
NPV of buying option	55,009	65,035	27,341	92,703

2. Evaluation of ABC Ltd's position under leasing option.

Particulars	Y 1	E 2	A 3	R NPV
Service Charges Receivable	2,20,000	2,60,000	2,60,000	
Cost of operation	(-)80,000	(-)80,000	(-)80,000	
Lease Rent	(-)96,000	(-)98,000	(-)98,000	
Incremental PBT	44,000	82,000	82,000	
Corporate tax @ 50%	(-)22,000	(-)41,000	(-)41,000	
	22,000	41,000	41,000	
Discounting factor @ 12%	*0.893	*0.797	*0.712	
NPV of Leasing option	19,646	32,677	29,192	81,515
Higher NPV under buying option				11,188

In view of above buying option is recommended

Note:

1. Maintenance and particularly insurance are to be paid by the owner. So, cash outflow of Rs.10,000 = Rs.20,000* (1 - 0.5) is not considered under leasing option.
2. Cash flows on account of Service Charges Receivable and Cost of Operation of the computer are common to both of the alternatives. These could therefore, have been eliminated. The NPV's of the options will change but the net NPV of Rs.11,188 will be the same. Full credit should be given for such answers also.

Evaluation from the lessor's point of view

The lessor is also supposed to buy the computer under the same terms of financing. His position is analysed below:

Particulars	Y 1	E 2	A 3	R NPV
Lease Rental	96,000	98,000	98,000	
Taxes & Insurance – being the owner, will be borne by the lessor	(-)20,000	(-)20,000	(-)20,000	
Loan Interest	(-)36,800	(-)36,800	(-)36,800	
Depreciation	(-)40,000	(-)40,000	(-)40,000	
Incremental PBT	(-)800	1,200	1,200	
Corporate tax	400	(-)600	(-)600	
(Assuming that the less will get adjusted with other profits for leasing out other assets)	(-)400	600	600	
Depreciation added back	40,000	40,000	40,000	
	39,600	40,600	40,600	
Terminal Disposal			1,10,000	
Repayment of Loan			(-)2,30,000	
Cash Flow	39,600	40,600	79,400	
Discount factor @ 16 (1- 0.5)% = 8%	*0.926	*0.857	*0.794	
NPV of leasing	36,670	36,670	(-)63,044	8,420

The NPV being positive, the proposal would be acceptable to the lessor also.

Alternative answer

Particulars	Y 1	E 2	A 3	R NPV
Lease Rental	96,000	98,000	98,000	
Taxes & Insurance – being the owner, will be borne by the lessor	(-)20,000	(-)20,000	(-)20,000	
Loan Interest	(-)36,800	(-)36,800	(-)36,800	
Depreciation	(-)40,000	(-)40,000	(-)40,000	
Incremental PBT	(-)800	1,200	1,200	

Corporate Tax @50%		(-) 200	(-) 600	
PAT	(-) 800	1,000	600	
Depreciation added back	40,000	40,000	40,000	
			40,600	
			(-) 1,20,000	
	39,200	41,000	(-) 79,400	
	*0.926	*0.857	*0.794	
	36,299	35,137	(-) 63,044	8,392

In view of the positive NPV , the proposal should be accepted by lessor.

Alternative 2

Evaluation from the point of view of lessee. The lessee has two alternatives: (i) To acquire the computer out of borrowed funds, and (ii) To acquire the computer on lease basis. The financial implications of these two options can be evaluated as follows:

Option I: To acquire computer out of borrowed funds. In this case, the company has to pay interest @ 16% annually and repayment of loan at the end of 3rd year. However, the salvage value of Rs.1,10,000 will be available to it. The information can be presented as follows:

Year	Interest	Depreciation	Expenses	Tax Shield (5)=50% of (2+3+4)	Cash outflows	PVF (8%)	PV (Rs.)
(1)	(2)	(3)	(4)	(5)	6=(2+4-5)		
1.	Rs.36,800	Rs.40,000	Rs.20,000	Rs.48,400	Rs.8,400	.926	7,778
2.	36,800	40,000	20,000	48,400	8,400	.857	7,199
3.	36,800	40,000	20,000	48,400	8,400	.794	6,670
4.	Repayment – Salvage (2,30,000 – 1,10,000)				Rs.1,20,000	.794	95,280
	Present Value of Outflows						1,16,927

Option II: To acquire the Computer on lease basis: In this case, the Company will be required to pay an annual lease rent of Rs.85,000 + 5% of annual billing at the end of year. The financial implications can be evaluated as follows:

Year	Rental	5% of Billing	Tax Shield	Cash Outflow	PV (8%)	{PV}
	(1)	(2)	(3)= (50% of 1+2)	(4)= (1+2+3)		
1	Rs.85,000	Rs.11,000	Rs.48,000	Rs.48,000	.926	Rs.44,448
2	85,000	13,000	49,000	49,000	.857	41,993
3	85,000	13,000	49,000	49,000	.794	38,906
	Present Value of Outflows					1,25,347

As the PV of outflows is less in case of buying option, the Company should borrow funds to buyout the computer.

Note: It may be noted that the additional expenses of Rs.80,000 to operate the computer have not been considered in the above calculation. These expenses are required in both the options and are considered to be irrelevant to decide between lease or buy.

Evaluation from the point of view of lessor:

	Year 1	Year 2	Year 3
Lease Rental	85,000	85,000	85,000
5% of Billing	11,000	13,000	13,000
Total Income	96,000	98,000	98,000
Less: Maintenance Expenses	20,000	20,000	20,000
Depreciation	40,000	40,000	40,000
Income before tax	36,000	38,000	38,000
Tax @ 50%	18,000	19,000	19,000
Net Income after Tax	18,000	19,000	19,000
Depreciation added back	40,000	40,000	40,000
Cash Inflow (Annual)	58,000	59,000	59,000
Scrap Value	-	-	1,10,000
	58,000	59,000	1,69,000
PVF (12%)	.893	.797	.712
Present Value	51,794	47,023	1,20,328
Total Present Value			2,19,145
Less: Initial Cost			2,30,000
Net Present Value			<u>-10,855</u>

As the NPV for the lessor is negative, he may not accept the proposal.

Question 2

- (a) A Ltd. wants to acquire T Ltd. and has offered a swap ratio of 1:2 (0.5 shares for every one share of T Ltd.). Following information is provided:

	A Ltd.	T. Ltd.
Profit after tax	Rs.18,00,000	Rs.3,60,000
Equity shares outstanding (Nos.)	6,00,000	1,80,000

EPS	Rs.3	Rs.2
PE Ratio	10 times	7 times
Market price per share	Rs.30	Rs.14

Required:

- (i) The number of equity shares to be issued by A Ltd. for acquisition of T Ltd.
 - (ii) What is the EPS of A Ltd. after the acquisition?
 - (iii) Determine the equivalent earnings per share of T Ltd.
 - (iv) What is the expected market price per share of A Ltd. after the acquisition, assuming its PE multiple remains unchanged?
 - (v) Determine the market value of the merged firm. (10 Marks)
- (b) XY Ltd. which is specialized in manufacturing garments is planning for expansion to handle a new contract which it expects to obtain. An investment bank have approached the company and asked whether the Co. had considered venture Capital financing. In 2001, the company borrowed Rs.100 lacs on which interest is paid at 10% p.a. The Company shares are unquoted and it has decided to take your advice in regard to the calculation of value of the Company that could be used in negotiations using the following available information and forecast.

Company's forecast turnover for the year to 31st March, 2005 is Rs.2,000 lacs which is mainly dependent on the ability of the Company to obtain the new contract, the chance for which is 60%, turnover for the following year is dependent to some extent on the outcome of the year to 31st March, 2005. Following are the estimated turnovers and probabilities:

Turnover Rs. (in lacs)	Year - 2005	Turnover Rs.(in lacs)	Year - 2006
	Prob.		Prob.
2,000	0.6	2,500	0.7
		3,000	0.3
1,500	0.3	2,000	0.5
		1,800	0.5
1,200	0.1	1,500	0.6
		1,200	0.4

Operating costs inclusive of depreciation are expected to be 40% and 35% of turnover respectively for the years 31st March, 2005 and 2006. Tax is to be paid at 30%. It is assumed that profits after interest and taxes are free cash flows. Growth in earnings is expected to be 40% for the years 2007, 2008 and 2009 which will fall to 10% each year after that. Industry average cost of equity (net of tax) is 15%. (10 Marks)

Answer

- (a) (i) The number of shares to be issued by A Ltd.:

The Exchange ratio is 0.5

So, new Shares = $1,80,000 \times .5 = 90,000$ shares.

- (ii) EPS of A Ltd. After a cquisition:

Total Earnings	(18,00,000+3,60,000)	Rs.21,60,000
No. of Shares	(6,00,000 + 90,000)	6,90,000
EPS	(21,60,000)/6,90,000)	Rs.3.13

- (iii) Equivalent EPS of T Ltd.:

No. of new Shares	0.5
EPS	Rs.3.13
Equivalent EPS (3.13 x .5)	Rs.1.57

- (iv) New Market Price of A Ltd. (P/E remaining unchanged):

Present P/E Ratio of A Ltd.	10 times
Expected EPS after merger	Rs.3.13
Expected Market Price (3.13 x 10)	Rs.31.30

- (v) Market Value of merged firm:

Total number of Shares	6,90,000
Expected Market Price	Rs.31.30
Total value (6,90,000 x 31.30)	Rs.2,15,97,000

- (b) Estimation of earnings for the years ended 31st March, 2005 & 2006

(Rs. In lacs)

Prob.	Turnover	Expected Turnover	Prob.	Turnover	Expected Turnover
0.6	2000	1200	0.6 x 0.7	2500	1050
			0.6 x 0.3	3000	540
0.3	1500	450	0.3 x 0.5	2000	300
			0.3 x 0.5	1800	270

0.1	1200	120	0.1 x 0.6	1500	90
		<u>1770</u>	0.1 x 0.4	1200	<u>48</u>
					2298
Operating Costs (40%)		(708)		(35%)	(804)
Interest 100 x 1		(10)			(10)
Profit after Interest		1052			1484
Tax		316			445
Earnings/Cash flows		736			1039

Estimated Cash flows for 2007 2008 & 2009:-

2007 - 1039 x 1.4 = 1455/-

2008 - 1455 x 1.4 = 2037/-

2009 - 2037 x 1.4 = 2852/-

Discounted Cash flows for the year 2005-2009

Year		Cash flows	Disc. Factor at 15%	PV
2005	-	736	0.870	640
2006	-	1039	0.756	785
2007	-	1455	0.658	957
2008	-	2037	0.572	1165
2009	-	2852	0.497	<u>1417</u>
				<u>4964</u>

Estimates of value of Cash flows from 2010 to infinity

Earnings in 2010 - 2852 x 1.1 = 3137

In today's money - 3137 x 0.497 = 1559

$$P_0 = D_1 / (K_e - G)$$

$$= 1559 / 0.15 - 0.10 = 31180/-$$

Present value of all future estimated cash flows:-

2005 - 2009	-	4964
2009 onwards	-	<u>31180</u>
		<u>36144</u>

∴ Company valuation is 36144/-

Note: Few printing errors have crept in this question viz 40% growth in earnings has appeared as 405 likewise 10% growth in earnings has been wrongly printed as 105. The answer provided above pertains to 40% and 10% growth.

Question 3

- (a) A USA based company is planning to set up a software development unit in India. Software developed at the Indian unit will be bought back by the US parent at a transfer price of US \$10 millions. The unit will remain in existence in India for one year; the software is expected to get developed within this time frame.

The US based company will be subject to corporate tax of 30 per cent and a withholding tax of 10 per cent in India and will not be eligible for tax credit in the US. The software developed will be sold in the US market for US \$ 12.0 millions. Other estimates are as follows:

Rent for fully furnished unit with necessary hardware in India	Rs.15,00,000
Man power cost (80 software professional will be working for 10 hours each day)	Rs.400 per man hour
Administrative and other costs	Rs.12,00,000

Advise the US company on financial viability of the project. The rupee-dollar rate is Rs.48/\$. (4 Marks)

- (b) BSE 500
- | | |
|-------------------------|--------------|
| Value of portfolio | Rs.10,10,000 |
| Risk free interest rate | 9% p.a. |
| Dividend yield on Index | 6% p.a. |
| Beta of portfolio | 1.5 |

We assume that a future contract on the BSE index with four months maturity is used to hedge the value of portfolio over next three months. One future contract is for delivery of 50 times the index.

Based on the above information calculate:

- (i) Price of future contract.
(ii) The gain on short futures position if index turns out to be 4,500 in three months. (8 Marks)

- (c) Following information relates to AKC Ltd. which manufactures some parts of an electronics device which are exported to USA, Japan and Europe on 90 days credit terms.

Cost and Sales information:

	Japan	USA	Europe
Variable cost per unit	Rs.225	Rs.395	Rs.510
Export sale price per unit	Yen 650	US\$10.23	Euro 11.99

Receipts from sale due in 90 days	Yen 78,00,000	US\$1,02,300	Euro 95,920
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Foreign exchange rate information:

	Yen/Rs.	US\$/Rs.	Euro/Rs.
Spot market	2.417-2.437	0.0214-0.0217	0.0177-0.0180
3 months forward	2.397-2.427	0.0213-0.0216	0.0176-0.0178
3 months spot	2.423-2.459	0.02144-0.02156	0.0177-0.0179

Advice AKC Ltd. by calculating average contribution to sales ratio whether it should hedge it's foreign currency risk or not. (8 Marks)

Answer

(a) Proforma profit and loss account of the Indian software development unit.

	Rs.	Rs.
Revenue		48,00,00,000
Less: Costs:		
Rent	15,00,000	
Manpower (Rs.400 x 80 x 10 x 365)	11,68,00,000	
Administrative and other costs	12,00,000	11,95,00,000
Earning before tax		36,05,00,000
Less: Tax		10,81,50,000
Earning after tax		25,23,50,000
Less: Withholding tax(TDS)		2,52,35,000
Repatriation amount (in rupees)		22,71,15,000
Repatriation amount (in dollars)		\$4.7 million

Note : Students may assume the year of 360 days instead of 365 days as has been done in the answer provided above. In such a case where a year is assumed to be of 360 days, manpower cost is Rs 11,52,00,000 and repatriated amount Rs 22,87,15,000.

Conclusion : The cost of development software in India for the US based company is \$5.268 million. As the USA based Company is expected to sell the software in the US at \$12.0 million, it is advised to develop the software in India.

(b) Note: It is assumed that the BSE Index on the day of hedging is 5000 instead of 500 as printed in the question paper. The following workings are based on this assumption.

$$(i) \text{ Current future price of the index} = 5000 + 5000 (0.09 - 0.06) \frac{4}{12}$$

$$= 5000 + 50 = 5,050$$

∴ Price of the future contract = Rs.50 x 5,050 = Rs.2,52,500

$$(ii) \text{ Hedge ratio} = \frac{1010000}{252500} \times 1.5 = 6 \text{ contracts}$$

Index after three months turns out to be 4500

$$\text{Future price will be} = 4500 + 4500 (0.09 - 0.06) \times \frac{1}{3} = 4,545$$

$$\text{Therefore, Gain from the short futures position is} = 6 \times (5050 - 4545) \times 50$$

$$= \text{Rs.1,51,500}$$

Alternative solution when BSE index is considered to be as 500

$$(i) \text{ Current future price of index} = 500 + 500 (0.09 - 0.06) \frac{4}{12} = 500 + 5 = 505$$

∴ Price of the future contract = Rs.50 x 505 = Rs.25,250.

$$(ii) \text{ Hedge Ratio} = \frac{10,10,000}{25,250} \times 1.5 = 60 \text{ contracts}$$

Index after three months turn out to be 4,500.

Future Price will be

$$= 4,500 + 4,500 (0.09 - 0.06) \frac{1}{3} = 4,545$$

Therefore, gain from the short future position is

$$= 60 \times (505 - 4545) \times 50$$

$$= -12,12,00,00.$$

(c) If foreign exchange risk is hedged.

				Total (Rs.)
Sum due	Yen 78,00,000	US\$1,02,300	Euro 95,920	
Unit input price	Yen 650	US\$10.23	Euro 11.99	
Unit sold	12000	10000	8000	
Variable cost per unit	Rs.225/-	395	510	

Variable cost	Rs.27,00,000	Rs.39,50,000	Rs.40,80,000	Rs.1,07,30,000
Three months forward rate for selling	2.427	0.0216	0.0178	
Rupee value of receipts	Rs.32,13,844	Rs.47,36,111	Rs.53,88,764	Rs.1,33,38,719
Contribution	Rs.5,13,844	Rs.7,86,111	Rs.13,08,764	Rs.26,08,719
Average contribution to sale ratio				19.56%

If risk is not hedged

Rupee value of receipt	Rs.31,72,021	Rs.47,44,898	Rs.53,58,659	Rs.1,32,75,578
Total contribution				Rs.25,45,578
Average contribution to sale ratio				19.17%

AKC Ltd. Is advised to hedge its foreign currency exchange risk.

Question 4

- (a) MP Ltd. issued a new series of bonds on January 1, 2000. The bonds were sold at par (Rs.1,000), having a coupon rate 10% p.a. and mature on 31st December, 2015. Coupon payments are made semiannually on June 30th and December 31st each year. Assume that you purchased an outstanding MP Ltd. Bond on 1st March, 2008 when the going interest rate was 12%.

Required:

- What was the YTM of MP Ltd. Bonds as on January 1, 2000?
- What amount you should pay to complete the transaction? Of that amount how much should be accrued interest and how much would represent bonds basic value.

(6 Marks)

- (b) AB Ltd. has recently approached the shareholders of CD Ltd. which is engaged in the same line of business as that of AB Ltd. with a bid of 4 new shares in AB Ltd. for every 5 CD Ltd. shares or a cash alternative of Rs.360 per share. Past records of earnings of CD Ltd. had been poor and the company's shares have been out of favour with the stock market for some time.

Pre bid information for the year ended 31.3.2006 are as follows:

	AB Ltd in lakhs	CD Ltd. in lakhs
Equity share capital	60	170
Number of shares	24	17
Pre-tax profit	125	110
P/E Ratio	11	7
Estimated post tax cost of Equity Capital per Annum	12%	10%

Both AB Ltd. and CD Ltd. pay income tax at 30%. Current earnings growth forecast is 4% for the foreseeable future of both the Companies.

Assuming no synergy exists, you are required to evaluate whether proposed share to share offer is likely to be beneficial to the shareholders of both the companies using merger terms available. AB Ltd.'s directors might expect their own pre bid P/E ratio to be applied to combined earnings.

Also comment on the value of the two Companies from the constant growth form of dividend valuation model assuming all earnings are paid out as dividends. (14 Marks)

Answer

- (a) (i) Since the bonds were sold at par, the original YTM was 10%.

$$Y + M = \frac{\text{Interest}}{\text{Principal}} = \frac{\text{Rs.100}}{\text{Rs.1,000}} 10\%$$

- (ii) Price of the bond as on 1st July, 2015 = Rs.50 × 9.712 + 1,000 × 0.417
 = Rs.902.60
 Total value of the bond on the next interest date = Rs.902.60 + Rs.50
 = Rs.952.60
 ∴ Value of bond at purchase date = Rs.952 × $\frac{1}{(1+0.6)^{2/3}}$
 = Rs.952.60 × Rs.0.731004 (by using excel)
 = Rs.696.35

The amount to be paid to complete the transaction is Rs.696.35. Out of this amount Rs.16.57 represent accrued interest and Rs.679.68 represent the bond basic value.

Alternative solution:

$$B_0 = \sum_{t=1}^{2n} \frac{\frac{1}{2}(Int_t)}{(1+\frac{kd}{2})^t} + \frac{B_m}{(1+\frac{kd}{2})^{2n}}$$

$$B_0 = \sum_{t=1}^{2 \times 15} \frac{\frac{1}{2}(100)}{(1+\frac{12}{2})^t} + \frac{1000}{(1+\frac{12}{2})^{2 \times 15}}$$

$$B_0 = \sum_{t=1}^{30} \frac{50}{(1.06)^t} + \frac{1000}{(1.06)^{2 \times 15}}$$

$$B_0 = 50 \times 13.765 + 1000 \times .174$$

$$= 688.25 + 174 = 862.25$$

Therefore Value of Bond at purchase date

$$= \text{Rs } 862.25 \times \text{Rs } 0.731004$$

$$= \text{Rs. } 630.31$$

The amount to be paid to complete the transaction is Rs.630.31. Out of this amount Rs.16.57 represent accrued interest and Rs.613.64 represent the bond basic value.

- (b) Alternative 1 (when number of shares are 2.4 and 1.7 lakhs respectively)

Evaluation:-

Background calculations:-

	(Figures in lakhs)		
	AB Ltd.	CD Ltd.	Total
PBT	125	110	235
PAT	87.5	77	164.5
Pre bid EPS	36.46	45.29	
P/E ratio	11	7	
Pre-bid Price Per Share	401.06	317.03	
Market value of the company	962.54	538.95	1,501.49
No. of New Shares Post bid	2.4	1.36	3.76
% combined company owned by	63.83%	36.17%	
Value to the original Shareholders	958.40	543.09	1,501.49
Post bid Price per share to original shareholders i.e., 2.40 lakhs and 1.70 lakhs shareholders respectively.	399.33	319.46	

(Note: The Post bid Price per share to new shareholders as per terms of acquisition works out to Rs.399.33 for both the companies)

These figures suggest post bid acquisition share price of Rs.399.33 for AB Ltd., and 319.46 for CD Ltd.'s. Original shareholders. The price of CD Ltd share is likely to be influenced by the value of cash alternative.

The post bid share price of the new firm can be estimated by applying the P/E ratio to the combined earnings of the two old companies.

In that case,

Market Value would be = $164.5 \times 11 = 1809.50$

Price per share of the combined company would be = $\frac{1809.50}{3.76} = \text{Rs.}481.25$

∴ Therefore share of AB Ltd., shareholders would raise by Rs.481.25 – Rs.401.06= Rs.80.19 i.e., 20%.

Share value of CD Ltd., shareholder expected to rise by

$$\left(\text{Rs.}481.25 \times \frac{4}{5} \right) - 317.03 = \text{Rs.}67.97 \text{ i.e. } 21.44\%$$

With the cash offer the premium is $\frac{360 - 317.03}{317.03} = 13.55\%$ only

Hence shareholders of CD Ltd are gaining more from the merger in a share exchange and cash alternative is unlikely to be accepted.

Using constant growth model the value of both the individual companies would be:

$$\text{AB Ltd., share price} = \frac{36.46(1.04)}{0.12 - 0.04} = \text{Rs.}473.98$$

$$\text{CD Ltd., share price} = \frac{45.29 \times 1.04}{0.10 - 0.04} = \text{Rs.}785.03$$

On this basis market slightly undervalues AB Ltd share but share of CD Ltd., are highly undervalued possibly because of previous disappointments. However, if AB Ltd. forecast is believed that the AB Ltd., is getting CD Ltd. shares, it will be a cheap proposal for AB Ltd. to acquire the CD Ltd. on share exchange basis and especially if any of the shareholder of CD Ltd. Accept the cash offer.

The shareholders of CD Ltd. would also be benefited post merger based on share exchange ratio since the value of their share would be going up from Rs.317.03 to Rs.399.33. However, their share price would still be undervalued as compared with the share price calculated by using constant growth model.

Alternative 2 (when number of shares are 24 and 17 lakhs respectively)

If we take into consideration the number of shares being 24 lakhs and 17 lakhs the Pre-bid share price works out to Rs.40.15 and Rs.31.71 respectively, which seems to be illogical against a cash offer @ Rs.360/- per share. However, since many students may have solved this question based on the figures of 24 lakhs and 17 lakhs number of shares, an alternative solution is provided below.

Evaluation:	Figures in lakhs		
Background calculations:	AB Ltd.	CD Ltd.	Total
PBT	125	110	235
PAT	87.5	77	164.5
Pre bid EPS	3.65	4.53	
P/E Ratio	11	7	
Pre-bid Price per share	40.15	31.71	
Market value of the company	963.60	539.07	1502.67
No. of new shares Post-bid	24	13.6	37.6
% of combined company owned by	63.83	36.17	
Value to the original shareholders	959.15	543.52	1502.67
Post-bid Price to original shareholders i.e., 24 lakhs and 17 lakhs shareholders respectively	39.96	31.97	

(Note: The Post bid price per share works out to Rs.39.96 for both the companies)

These figures suggest Post acquisition share price of Rs.39.96 for AB Ltd and Rs.31.97 for CD Ltd's original shareholders. The Price of CD Ltd. Share is likely to be influenced by the value of cash alternative.

The Post bid share price of the new firm can be estimated by applying the P/E ratio to the combined earnings of the two old companies.

In that case,

Market-value would be = $164.5 \times 11 = 1809.50$

Price per share of the combined company

Would be = $\frac{1809.50}{37.6} = 48.13$

∴ Shares of AB Ltd. shareholders would raise by Rs.48.13 – 40.15 = 7.98 i.e., 19.87% or 20%.

Share value of CD Ltd., shareholders expected to raise by Rs. $\left(48.13 \times \frac{4}{5}\right) - 31.71$
= Rs.7.40 or 23.34%.

However, with the cash offer the premium is $\frac{360 - 31.71}{31.71} = 1035.29\%$

Hence, the shareholders of CD Ltd., are substantially benefited by cash offer and they are unlikely to accept the share swap ratio.

Using constant growth model the value of shares of both the individual companies would be

$$\begin{aligned} \text{AB Ltd. Share Price} &= \frac{3.65(1.04)}{0.12 - 0.04} = \frac{3.80}{0.08} \\ &= \text{Rs.47.5} \end{aligned}$$

$$\begin{aligned} \text{CD Ltd. Share Price} &= \frac{4.53(1.04)}{0.10 - 0.04} = \frac{4.71}{0.06} \\ &= \text{Rs.78.5} \end{aligned}$$

On this basis market slightly undervalues AB Ltd. Share but share of CD Ltd., is highly undervalued possibly because of previous disappointments. However, if AB Ltd. forecast is believed that the AB Ltd. is getting CD Ltd. share it will be a cheap proposal for AB Ltd., to acquire CD Ltd., on share exchange basis.

The shareholders of CD Ltd., would however be more benefited by cash offer.

Question 5

- (a) From the following data for Government securities, calculate the forward rates:

Face value (Rs.)	Interest rate	Maturity (Year)	Current price (Rs.)
1,00,000	0%	1	91,500
1,00,000	10%	2	98,500
1,00,000	10.5%	3	99,000

(6 Marks)

- (b) On the basis of the following information:

Current dividend (Do)	=	Rs.2.50
Discount rate (k)	=	10.5%
Growth rate (g)	=	2%

- (i) Calculate the present value of stock of ABC Ltd.
- (ii) Is its stock overvalued if stock price is Rs.35, ROE = 9% and EPS = Rs.2.25?
Show detailed calculation. (6 Marks)
- (c) (i) What are derivatives?
- (ii) Who are the users and what are the purposes of use?
- (iii) Enumerate the basic differences between cash and derivatives market. (8 Marks)

Answer

- (a) Consider one year treasury bill.

$$91,500 = \frac{1,00,000}{1+r_1}$$

$$1+r_1 = \frac{1,00,000}{91,500}$$

$$= 1.092896$$

$$r_1 = 0.0929 \text{ or } 0.093$$

Consider two year Government Security

$$98,500 = \frac{10,000}{1.093} + \frac{1,10,000}{(1.093)(1+r_2)}$$

$$98,500 = 9,149.131 + \frac{1,10,000}{1.093(1+r_2)}$$

$$\Rightarrow 89,350.87 = \frac{1,00,640.4}{1+r_2}$$

$$\Rightarrow 1+r_2 = 1.126351$$

$$r_2 = 0.12635$$

$$\Rightarrow r_2 = 0.1263$$

Consider three year Government Securities:

$$99,000 = \frac{10,500}{1.093} + \frac{10,500}{1.093 \times 1.1263} + \frac{1,10,500}{1.093 \times 1.1263(1+r_3)}$$

$$\Rightarrow 99,000 = 9,606.587 + 8,529.65 + \frac{89,764.42}{1+r_3}$$

$$\Rightarrow 80,863.763 = \frac{89,764.42}{1+r_3}$$

$$\Rightarrow 1+r_3 = 1.1100697$$

$$\Rightarrow r_3 = .1100697$$

(b) (i) Present Value of the stock of ABC Ltd. Is:-

$$V_0 = \frac{2.50(1.02)}{0.105 - 0.02}$$

$$= \text{Rs.}30/-.$$

(ii) Pay out ratio of ABC Ltd. $= \frac{2.5}{2.25}$

$$= 1.111$$

Hence, Retention ratio $= 1 - 1.111$

$$= -0.111$$

Or -11.1%

Sustainable growth ratio is $= -0.111 \times 0.09$

$$= -0.00999$$

$$= -0.999\%$$

Using the constant growth model, the value is

$$= \frac{\text{Rs.}2.50(0.99)}{0.105 - (-0.00999)}$$

$$= \frac{2.475}{0.11499}$$

$$= \text{Rs.}21.52$$

This value is less than the stock price of Rs.30/- as calculated above or Rs.35, as given in the question, which indicates that stock of ABC Ltd. is Overvalued.

Alternative answer (ii)

$$(\text{MV}) \text{ of Stock in Rs.} = \frac{D_1}{k_e - g} = \frac{D_0(1+g)}{(k_e - g)}$$

$$= \frac{2.5 \times 1.02}{0.105 - 0.02} = 30(\text{BV}) = \frac{\text{Rs.}225}{0.09} = \text{Rs.}25$$

Again $\frac{(\text{MV})}{(\text{BV})} = \frac{k_r - g}{k_e - g}$ where symbols denote their usual notations.

$$\text{So, } \frac{0.09 - 0.02}{0.105 - 0.02} = \frac{(MV)}{25} \text{ or, } \frac{0.07}{0.085} = \frac{(MV)}{25}$$

$$\therefore (MV) = \frac{\text{Rs.}0.07}{0.085} \times 25 = \text{Rs.}20.59$$

Based on $\frac{(MV)}{(BV)}$ ratio and based on perpetual growth model the price of the share should be Rs.20.59 and Rs.30 respectively which are lower than the present (MV) of Rs.35.

The stock is therefore, Overvalued.

- (c) (i) Derivative is a product whose value is to be derived from the value of one or more basic variables called bases (underlying assets, index or reference rate). The underlying assets can be Equity, Forex, Commodity.

	Users	Purpose
(i)	Corporation	To hedge currency risk and inventory risk
(ii)	Individual Investors	For speculation, hedging and yield enhancement.
(iii)	Institutional Investor	For hedging asset allocation, yield enhancement and to avail arbitrage opportunities.
(iv)	Dealers	For hedging position taking, exploiting inefficiencies and earning dealer spreads.

The basic differences between Cash and the Derivative market are enumerated below:-

In cash market tangible assets are traded whereas in derivate markets contracts based on tangible or intangibles assets likes index or rates are traded.

- In cash market tangible assets are traded whereas in derivative market contracts based on tangible or intangibles assets like index or rates are traded.
- In cash market, we can purchase even one share whereas in Futures and Options minimum lots are fixed.
- Cash market is more risky than Futures and Options segment because in "Futures and Options" risk is limited upto 20%.
- Cash assets may be meant for consumption or investment. Derivate contracts are for hedging, arbitrage or speculation.
- The value of derivative contract is always based on and linked to the underlying security. Though this linkage may not be on point-to-point basis.
- In the cash market, a customer must open securities trading account with a

securities depository whereas to trade futures a customer must open a future trading account with a derivative broker.

- (g) Buying securities in cash market involves putting up all the money upfront whereas buying futures simply involves putting up the margin money.
- (h) With the purchase of shares of the company in cash market, the holder becomes part owner of the company. While in future it does not happen.

Question 6

- (a) What is a Green share option? Explain its working mechanism. (5 Marks)
- (b) Write a short note on the application of Double taxation agreements on Global depository receipts. (4 Marks)
- (c) "Operations in foreign exchange market are exposed to a number of risks." Discuss. (3 Marks)
- (d) XYZ Ltd. has substantial cash flow and until the surplus funds are utilised to meet the future capital expenditure, likely to happen after several months, are invested in a

portfolio of short-term equity investments, details for which are given below:

Investment	No. of shares	Beta	Market price per share Rs.	Expected dividend yield
I	60,000	1.16	4.29	19.50%
II	80,000	2.28	2.92	24.00%
III	1,00,000	0.90	2.17	17.50%
IV	1,25,000	1.50	3.14	26.00%

The current market return is 19% and the risk free rate is 11%.

Required to:

- (i) Calculate the risk of XYZ's short-term investment portfolio relative to that of the market;
- (ii) Whether XYZ should change the composition of its portfolio. (8 Marks)

Answer

- (a) **GREEN SHOE OPTION (GSO):** Green Shoe Option (GSO) means an option available to the company issuing securities to the public to allocate shares in excess of the public issue and operating a post-listing price stabilising mechanism through a stabilising agent. SEBI inserted a new Chapter No. VIII-A, with effect from August 14, 2003, in the SEBI (Disclosure and Investors Protection) Regulations, 2000 to deal with the GSO. The GSO is available to a company which is issuing equity shares through book-building mechanism for stabilising the post-listing price of the shares. The following is the

mechanism of GSO:

1. The Company shall appoint one of the leading book runners as the Stabilising Agent (SA), who will be responsible for the price stabilising process.
2. The promoters of the company will enter into an agreement with SA to lend some of their shares to the latter, not exceeding 15% of the total issue size.
3. The borrowed shares shall be in the dematerialised form. These shares will be kept in a separate GSO Demat A/c.
4. In case of over subscription, the allocation of these share shall be on pro-rata basis to all applicants.
5. The money received from allotment of these shares shall also be kept in a 'GSO Bank A/c', distinct from the issue account, and the amount will be used for buying shares from the market during the stabilization period.
6. The shares bought from the market by SA for stabilization shall be credited to GSO Demat Account.
7. These shares shall be returned to the promoters within 2 days of closure of stabilisation process.
8. In order to stabilise post-listing prices, the SA shall determine the timing and quantity of shares to be bought.
9. If at the expiry of the stabilisation period, the SA does not purchase shares to the extent of over-allocated shares, then shares to the extent of shortfall will be allotted by the company to the GSO Demat A/c multiplied by the issue price. Amount left in the GSO Bank A/c (after meeting expenses of SA), shall be transferred to the Investors Protection Fund.

In April, 2004, the ICICI Bank Ltd. Became the first Indian company to offer GSO.

- (b) (i) During the period of fiduciary ownership of shares in the hands of the overseas depository bank, the provisions of avoidance of double taxation agreement entered into by the Government of India with the country of residence of the overseas depository bank will be applicable in the matter of taxation of income from dividends from the underlined shares and the interest on foreign currency convertible bonds.
- (ii) During the period if any, when the redeemed underlined shares are held by the non-residence investors on transfer from fiduciary ownership of the overseas depository bank, before they are sold to resident purchasers, the avoidance of double taxation agreement entered into by the government of India with the country of residence of the non-resident investor will be applicable in the matter of taxation of income from dividends from the underlined shares, or interest on foreign currency convertible bonds or any capital gains arising out of the transfer of the underlined shares.
- (c) A firm dealing with foreign exchange may be exposed to foreign currency exposures. The exposure is the result of possession of assets and liabilities and transactions denominated in foreign currency. When exchange rate fluctuates, assets, liabilities,

revenues, expenses that have been expressed in foreign currency will result in either foreign exchange gain or loss. A firm dealing with foreign exchange may be exposed to the following types of risks:

- (i) **Transaction Exposure:** A firm may have some contractually fixed payments and receipts in foreign currency, such as, import payables, export receivables, interest payable on foreign currency loans etc. All such items are to be settled in a foreign currency. Unexpected fluctuation in exchange rate will have favourable or adverse impact on its cash flows. Such exposures are termed as transactions exposures.
- (ii) **Translation Exposure:** The translation exposure is also called accounting exposure or balance sheet exposure. It is basically the exposure on the assets and liabilities shown in the balance sheet and which are not going to be liquidated in the near future. It refers to the probability of loss that the firm may have to face because of decrease in value of assets due to devaluation of a foreign currency despite the fact that there was no foreign exchange transaction during the year.
- (iii) **Economic Exposure:** Economic exposure measures the probability that fluctuations in foreign exchange rate will affect the value of the firm. The intrinsic value of a firm is calculated by discounting the expected future cash flows with appropriate discounting rate. The risk involved in economic exposure requires measurement of the effect of fluctuations in exchange rate on different future cash flows.

(d) (i) **Computation of Beta of Portfolio**

<i>Investment</i>	<i>No. of shares</i>	<i>Market Price</i>	<i>Market Value</i>	<i>Dividend Yield</i>	<i>Dividend</i>	<i>Composition</i>	β	<i>Weighted β</i>
I.	60,000	4.29	2,57,400	19.50%	50,193	0.2339	1.16	0.27
II.	80,000	2.92	2,33,600	24.00%	56,064	0.2123	2.28	0.48
III.	1,00,000	2.17	2,17,000	17.50%	37,975	0.1972	0.90	0.18
IV.	1,25,000	3.14	3,92,500	26.00%	1,02,050	0.3566	1.50	0.53
			<u>11,00,500</u>		<u>2,46,282</u>	<u>1.0000</u>		<u>1.46</u>

$$\text{Return of the Port Folio} = \frac{2,46,282}{11,00,500} = 0.2238$$

$$\text{Beta of Port Folio} = 1.46$$

Market Risk implicit

$$0.2238 = 0.11 + \beta \times (0.19 - 0.11)$$

$$\text{Or, } 0.08 \beta + 0.11 = 0.2238$$

$$\beta = \frac{0.2238 - 0.11}{0.08} = 1.42$$

Market β implicit is 1.42 while the portfolio β is 1.46. Thus the portfolio is marginally risky compared to the market.

- (ii) The decision regarding change of composition may be taken by comparing the dividend yield (given) and the expected return as per CAPM as follows:

Expected return

R_s as per CAPM is:

$$R_s = I_{RF} + (R_M - I_{RF}) \beta$$

$$\begin{aligned} \text{For investment I } R_s &= I_{RF} + (R_M - I_{RF}) \beta \\ &= .11 + (.19 - .11) 1.16 \\ &= 20.28\% \end{aligned}$$

$$\text{For investment II, } R_s = .11 + (.19 - .11) 2.28 = 29.24\%$$

$$\begin{aligned} \text{For investment III, } R_s &= .11 + (.19 - .11) .90 \\ &= 18.20\% \end{aligned}$$

$$\begin{aligned} \text{For investment IV, } R_s &= .11 + (.19 - .11) 1.50 \\ &= 23\% \end{aligned}$$

Comparison of dividend yield with the expected return R_s shows that the dividend yields of investment I, II and III are less than the corresponding R_s . So, these investment are over-priced and should be sold by the investor. However, in case of investment IV, the dividend yield is more than the corresponding R_s , so, XYZ Ltd. should increase its proportion..