

Institute of Actuaries of India

Subject CT2 – Finance and Financial Reporting

September 2016 Examination

INDICATIVE SOLUTION

Introduction

The indicative solution has been written by the Examiners with the aim of helping candidates. The solutions given are only indicative. It is realized that there could be other points as valid answers and examiner have given credit for any alternative approach or interpretation which they consider to be reasonable.

Solution 1: A

$$(50,00,000 - 10,00,000 + 8,00,000 - 5,00,000) * 25\% = 10,75,000$$

[2]

Solution 2: C

[2]

Solution 3: D

[2]

Solution 4: C

[2]

Solution 5: A

[2]

Solution 6: A

[2]

Solution 7: C

[2]

Solution 8: D

[2]

Solution 9: C**Solution 10: D**

[2]

Solution 11:

i) The current worth of 5 shares is = Rs 200 per share X 5 = Rs 1000

The expansion plan will increase the value of company by 25% so the shares would increase in value to Rs 1000 *1.25 = Rs 1250

The cash injection would further add Rs 175 to the value per share = Rs 1250 + 175 = Rs 1425

The value of each share would be = Rs 1425/ 6 = Rs 237.5

[3]

ii) The effective conversion price is the price an investor pays for a share by buying it via the convertible rather than on the cash market. The stock is trading at par and so Rs 50 stock costs Rs 50.

Effective conversion price = Rs 50/4 = Rs 12.5

The conversion premium is the effective conversion price minus current share price.

= Rs 12.5 – Rs 9 = Rs 3.5

[2]

[5 Marks]

Solution 12:

i)

	NORTH	WEST
(a) Profitability Ratios		
ROCE	$560/(1500+400) = 29.4\%$	$950/(2500+200) = 35.2\%$
Gross Profit Percent*	$900/1500 = 60\%$	$1550/2500 = 62\%$
Net Profit Percent*	$535/1500 = 35.7\%$	$938/2500 = 37.5\%$
(b) Liquidity		
Current Ratio	$180/280 = 0.64:1$	$430/130 = 3.3:1$
(c) Receivables Management		
Receivables Turnover	$=180/1500*365 = 43.8$ days	$430/2500*365 = 62.8$ days

*Either of these 2 ratios. ROCE or ROE is mandatory. Small comment on compare of performance expected.

[3+1.5+1.5]

ii) The directors should consider whether the figures are directly comparable. The accounting policies should be the same in both companies, but the underlying assumptions may be different. For example, North may be a little more conservative when it comes to booking turnover.

The nature of the local markets may also be different. It may be that North is already doing as well as is possible, subject to the local conditions including local competition. Changes may actually be counter-productive.

West is much bigger in terms of turnover and that might create economies of scope that are not available to North. For example, West may be able to negotiate much harder with vendors.

[3]**[9 Marks]****Solution 13:**

i) According to the going concern concept, accounts should be prepared on the assumption that the business will continue indefinitely in its present form.

This concept acts as a justification for the limitations imposed by the cost concept because there is little harm in reporting historical figures for value if the assets concerned are unlikely to be sold in the immediate future.

[2]

ii) The going concern concept effectively requires consideration of the long-term future. A company's ability to survive may depend on many different factors, each of which is very difficult to predict. For example, the market for the entity's products could decline or there could be a problem with cash flows and the availability of finance to deal with that. Similarly, the ability of company to respond to new challenges may diminish over time

which can potentially cause question mark on going concern.

Another difficulty is that preparers will only ever be challenged when the company has actually run into difficulties. Users of financial statements may claim that the going concern status was inappropriate on the basis of actual outcomes rather than expectations based on the information that was available at the time. Many users, such as buyers, will place a great deal of emphasis on going concern.

[4]

[6 Marks]

Solution 14:**a) Income Statement for the year ended 31st March 2016**

	INR ('000)
Revenue	1,686,000
Less : Cost of sales (Note 2)	(787,200)
Gross profit	898,800
Administration expenses	(3,600)
Distribution costs (Note 3)	(231,000)
Earnings Before Interest & Tax	664,200
Interest paid	(38,400)
Net Profit for year	625,800

b) Statement of changes in Equity for the Year

	INR ('000)			
Particulars	Share Capital	Revaluation Reserve	Retained Earnings	Total
Opening Capital	210,000	240,000	262,350	712,350
Revaluation (Note 4)		255,000		255,000
Profits for the year			625,800	625,800
Dividends (incl Dividend Tax)			(150,000)	(150,000)
Closing Balance	210,000	495,000	738,150	1,443,150

(4 marks including 1 mark each for revaluation and Dividend treatment)

c) Statement of Financial Position as at 31st March 2016

	INR ('000)
Non-current Assets – Property, Plant & Equipment (Note 1)	1,639,800
<u>Current Assets</u>	
Inventory	36,000
Trade Receivables	126,000
TOTAL ASSETS	1,801,800

Equity (from (b))	1,443,150
Loan	300,000
<u>Current Liabilities</u>	
Trade Payables	57,000
Bank Overdraft	1,650
TOTAL LIABILITIES	1,801,800

NOTE 1 Property Plant and Equipment

	INR ('000)			
Cost/ Revaluation	Land	Building	Machinery	Vehicle
Total				
Opening Balance	840,000	450,000	186,000	375,000
1,851,000				
Revaluation	160,000	50,000		
210,000				
Closing Balance	1,000,000	500,000	186,000	375,000
2,061,000				
Accumulated Depreciation				
Opening Balance		45,000	84,000	255,000
384,000				
Revaluation		(45,000)		
(45,000)				
Annual Dep. Charge		15,000	37,200	30,000
82,200				
Total		15,000	121,200	285,000
421,200				
Net Book Value	1,000,000	4, 85,000	64,800	90,000
1,639,800				

NOTE 2 Cost of Sales	INR ('000)
Cost of Inventory Consumed	4,35,000
Factory Running Cost	1,05,000
Manufacturing Wages	1,95,000
Depreciation of Buildings	15,000
<u>Depreciation of Machinery</u>	<u>37,200</u>
Total	<u>787,200</u>

Note 3 Distribution Costs	INR ('000)
Advertising	66,000
Sales Salaries	84,000
Delivery Vehicle Running Costs	51,000
<u>Depreciation of Vehicles</u>	<u>30,000</u>
<u>Total</u>	<u>231,000</u>
Note 4 Revaluation	INR ('000)
Land	1,60,000
<u>Building</u>	<u>95,000</u>
<u>Total</u>	<u>255,000</u>

[20 Marks]

Solution 15:

i)

The term “money markets” is a part of Investment markets which covers bank deposits and short-term securities such as Treasury bills and bills of exchange.

[2]

(ii) Objectives of a Central Bank**1. Controlling short-term interest rates**

Short-term interest rates are a powerful tool for controlling the level of activity in the economy. A Central Bank uses its purchases and sales of bills to influence short-term interest rates.

For example, if a Central Bank wants base rates to be 7%, it will be prepared to buy and sell bills at a price that is equivalent to an interest rate of about 7%. Other banks are then likely to set their own interest rates at 7%. Although there is no obligation on the banks to set their own base rates at the official level, in normal market conditions, they usually do.

A bank's base rate is the rate of interest that forms the basis for variable interest rate loans. For example, a small business might take out a loan from a high street bank at “7% over base”. If the bank's base rate fell from 7% to 6.5%, the rate of interest charged on the loan would fall from 7% to 6.5%.

If the official base rate were 7%, but one commercial bank set its rate at 6%, that bank would find that a lot of institutions would want to borrow money from it at 6%. It would quickly run out of cash and need to borrow itself at the market rate of 7%. Not a good idea!

Similarly, if a commercial bank offered a high rate of interest of 8%, say, it would find that other institutions would want to deposit money with it. It would then need to do something with its spare cash, i.e. lend to other banks at 7%. This is also a not a good idea.

So, in practice, a Central Bank does have effective control over short-term interest rates. A Central Bank is not obliged to accept the bids and offers it receives from the commercial banks for cash. If it is not happy with the bids and offers it receives, the Bank can simply step back from the money market and set the rate at which it will act as lender of last resort. In these circumstances the commercial banks have no option but to deal with a Central Bank on its terms.

2. Providing liquidity

Every day some of a bank's customers withdraw money and write out cheques whilst others deposit money or repay loans. Often most of the money withdrawn from one bank will find its way into another bank. Alternatively, the banks can use the deposits that they hold with a Central Bank to transfer money from one bank's account to another.

In its money market operations, a Central Bank satisfies the marginal liquidity demand of the banking system as a whole through open market operations conducted transparently in high credit quality market instruments. A Central Bank achieves this predominately through transactions conducted under sale and repurchase (repo) agreements.

A "repo agreement" is where an asset is actually sold to one party, and a simultaneous agreement made for the other party to buy it back at a fixed price at a fixed date in the future.

By providing the liquidity needed by the banking system for settlement of money market transactions, the Bank acts as the marginal supplier of money to the banking system, enabling effective system-wide liquidity management in normal market conditions.

3. To regulate the currency market

The government maintains large amounts of gold and foreign currencies, collectively known as the "foreign reserves". By selling foreign reserves in return for local currency, a Central Bank can decrease the supply of local currency and so increase its price in terms of other currencies. Similarly, if the government feels that local currency is overvalued, a

Central Bank can sell local currency (thus increasing the foreign reserves) to force the exchange rate down.

4. Providing information to the investment markets

A Central Bank publishes a great deal of information which will be of interest to investors in the financial markets, and thus indirectly influences the markets. It compiles and publishes a range of monetary and financial statistics. These include domestic banking statistics, external finance statistics and international banking statistics.

[8]

[10 Marks]

Solution 16:

i) Statement showing value fund for 10 years in this option-

				In CT
Year	Fund at Beginning	Withdrawal for Annual Expenses (in beginning)	Interest Deducted	Fund at End of year
1	1,000,000	- 100,000	- 18,000	882,000
2	882,000	- 96,000	- 15,720	770,280
3	770,280	- 92,160	- 13,562	664,558
4	664,558	- 88,474	- 11,522	564,562
5	564,562	- 84,935	- 9,593	470,034
6	470,034	- 81,538	- 7,770	380,726
7	380,726	- 78,276	- 6,049	296,401
8	296,401	- 75,145	- 4,425	216,831
9	216,831	- 72,139	- 2,894	141,798
10	141,798	- 69,253	- 1,451	71,094

The residual value after 10 years is 71,904 CT

[3]

ii)

Statement showing value fund for 10 years in this option-

Currency Rate	Year	Fund at Beginning	Withdrawal for Annual Expenses (in beginning)	Interest Earned	IN US\$ Fund at End of year
5.00	1	200,000	- 20,000	5,400	185,400
4.75	2	185,400	- 20,211	4,956	170,145
4.50	3	170,145	- 20,480	4,490	154,155
4.25	4	154,155	- 20,817	4,000	137,338
4.00	5	137,338	- 21,234	3,483	119,587
3.75	6	119,587	- 21,743	2,935	100,779
3.50	7	100,779	- 22,365	2,352	80,767
3.25	8	80,767	- 23,122	1,729	59,375
3.00	9	59,375	- 24,046	1,060	36,388
2.75	10	36,388	- 25,183	336	11,542

The residual value after 10 years is US\$ 11542 * 2.75 = 31,739 CT

[4]

(iii) Option (a) should be preferred since the residual fund after 10 years for option (a) is more than option (b).

[1]

(iv) Statement showing value fund for 10 years in this option-

Year	Fund at Beginning	Withdrawal for Annual Expenses (in beginning)	Security Charges	In CT Fund at End of year
1	1,000,000	- 100,000	- 10,000	890,000
2	890,000	- 96,000	- 10,000	784,000
3	784,000	- 92,160	- 10,000	681,840
4	681,840	- 88,474	- 10,000	583,366
5	583,366	- 84,935	- 10,000	488,431
6	488,431	- 81,538	- 10,000	396,893
7	396,893	- 78,276	- 10,000	308,617
8	308,617	- 75,145	- 10,000	223,472
9	223,472	- 72,139	- 10,000	141,333
10	141,333	- 69,253	- 10,000	62,080

The residual value after 10 years is 62,080 CT

Since it is less than the residual fund value for Option (a), this should not be preferred.

[3]

(v) Statement showing value fund for 10 years in this option-

				In CT
Year	Fund at Beginning	Withdrawal for Annual Expenses (in beginning)	Insurance Premium	Fund at End of year
1	1,000,000	- 100,000	- 25,000	875,000
2	875,000	- 96,000	- 21,875	757,125
3	757,125	- 92,160	- 18,928	646,037
4	646,037	- 88,474	- 13,567	543,996
5	543,996	- 84,935	- 11,424	447,637
6	447,637	- 81,538	- 2,238	363,861
7	363,861	- 78,276	- 1,819	283,766
8	283,766	- 75,145	- 1,419	207,202
9	207,202	- 72,139	- 1,036	134,027
10	134,027	- 69,253	- 670	64,104

The residual value after 10 years is 64,104CT

Since it is less than the residual fund value for Option (a), this should not be preferred.

[3]

(vi) Statement showing value fund for 10 years in this option-

				In CT
Year	Fund at Beginning	Withdrawal for Annual Expenses (in beginning)	Insurance Premium	Fund at End of year
1	1,000,000	- 100,000	- 22,000	878,000
2	878,000	- 96,000	- 19,316	762,684
3	762,684	- 92,160	- 16,779	653,745
4	653,745	- 88,474	- 13,729	551,542
5	551,542	- 84,935	- 11,582	455,025
6	455,025	- 81,538	- 2,275	371,212
7	371,212	- 78,276	- 1,856	291,080
8	291,080	- 75,145	- 1,455	214,479
9	214,479	- 72,139	- 1,072	141,268
10	141,268	- 69,253	- 706	71,309

The residual value after 10 years is 71,309 CT.

The response to part (e) would change since now the residual value is more than part (a).

[3]

(vii) Statement showing value fund for 10 years to maximize the residual value-

Year	Fund at Beginning	Withdrawal for Annual Expenses (in beginning)	Outgo as per option selected	Fund at End of year	In CT Option selected
1	1,000,000	- 100,000	- 10,000	890,000	Security
2	890,000	- 96,000	- 10,000	784,000	Security
3	784,000	- 92,160	- 10,000	681,840	Security
4	681,840	- 88,474	- 10,000	583,366	Security
5	583,366	- 84,935	- 9,969	488,462	Deposit
6	488,462	- 81,538	- 8,138	398,786	Deposit
7	398,786	- 78,276	- 1,994	318,516	Insurance
8	318,516	- 75,145	- 1,593	241,778	Insurance
9	241,778	- 72,139	- 1,209	168,430	Insurance
10	168,430	- 69,253	- 842	98,335	Insurance

The maximized residual value after 10 years is 98,335 CT

[3]

[20 Marks]

Solution 17 :

i) Part 1 – Calculate ABC’s cost of ordinary equity, using the dividend valuation model:

$$K_e = D_0 * (1 + g) / P_0 + g$$

$$D_0 = 0.2$$

$$G = 12\%$$

(Dividends have increased at an average compound growth rate of 13.4% over the past five years.)

$$P_0 = 12.70 - 0.20$$

(ABC’s share price is Rs. 12.70 cum dividend on 31 March 2016, including a dividend of Rs. 0.20 per share)

$$K_e = 0.2 \times (1 + 0.12) / (12.7 - 0.2) + 0.12 = 0.138$$

$$K_e = 13.8\%$$

[3]

ii) Part 2 – Calculate ABC’s weighted average cost of capital (WACC):

$$K = ((K_e \times V_e) + (K_d \times V_d)) / (V_e + V_d)$$

Step 1: Calculate K_e of ordinary shares

$$K_e = 13.8\% \text{ (from above)}$$

Step 2: Calculate V_e of ordinary shares

Number of shares x current share price

- Number of shares = Rs. 120m/Rs. 10 = 12m shares

- Current share price = Rs. 12.7 – Rs. 0.2 = Rs. 12.5
- 12m x Rs. 12.5
- **Ve =Rs. 150m**

Step 3: Calculate Ke (or Kpref) of preference shares

$$K_{pref} = d/p_0$$

$$\text{Rs. } 0.72 / \text{Rs. } 9.2$$

(7.2% Preference shares irredeemable, Rs. 10.0 Face Value)

(Preference shares are trading at Rs. 9.2 each on 31 March 2016)

$$\mathbf{K_{pref} = 7.8\%}$$

Step 4: Calculate Ve (or Vpref) of preference shares

Number of shares x current share price

- Number of shares = Rs.100m/Rs. 10 = 10m shares
- Current share price = Rs. 9.2
- 10m x Rs. 9.2
- **Vpref = Rs. 92m**

Step 5: Calculate Kd

$$K_d = i (1-t)$$

I = (7.5% + 2%) The interbank rate plus 2%

$$T = 25\%$$

(Corporate income tax is charged at 25% on taxable profits and is settled a year in arrears)

$$K_d = (0.075+0.02) (1-0.25)$$

$$K_d = 0.071$$

$$\mathbf{K_d = 7.1\%}$$

Step 6: Calculate Vd

Vd = total book value (It is same as market value since it is nominal in nature)

$$\mathbf{V_d = Rs. 95m}$$

Step 7: Calculate WACC

$$K = ((K_e \times V_e) + (K_d \times V_d)) / (V_e + V_d)$$

$$K = (13.8\% \times 150) + (7.8\% \times 92) + (7.1\% \times 95) / (150+92+95)$$

$$K = (20.7) + (7.2) + (6.8) / (337)$$

$$K = 34.7/337$$

$$K = 0.103$$

$$K = 10.3\%$$

[7]

[10 Marks]
