

Actuarial Society of India

EXAMINATIONS

June 2005

CT2 – Finance and Financial Reporting

Indicative Solution

1	A
2	C
3	C
4	A
5	D
6	B
7	B
8	D
9	C
10	C

11

Toll revenues

Use the midpoints of each range, so that the expected toll revenue if the bridge is a success is 45 in each of year 3 to 5, whereas if it is a failure, the revenue is 25 in each of these years.

Weather

In the case of good weather, the cost in year 2 is zero . In the case of bad weather, the cost in year two is 20 (assuming no strikes).

Strikes

If there are no strikes, the costs are as noted under weather. If there are strikes, then the costs are increased to 60 in year 1, and either 0 (good weather) or 24 (bad weather) in year 2.

An outcome or state of world is denoted by a string of three numbers, and the probabilities, cash flows and NPVs associated with each possible state of the world are summarized in the table below.

Probabilities	Cash flows in each year	State of the world	NPV @ 10%
1/6	-50,0,45,45,45	A1,B1,C1	51.74
1/4	-50,-20,45,45,45	A1,B2,C1	33.55
1/6	-60,0,45,45,45	A1,B1,C2	41.73
1/12	-60,-24,45,45,45	A1,B2,C2	19.92
1/12	-50,0,25,25, 25	A2,B1,C1	6.52
1/8	-50,-20,25,25,25	A2,B2,C1	-11.66
1/12	-60,-0,25,25,25	A2,B1,C2	-3.48

1/24	-60,-24,25,25,25	A2,B2,C2	-25.30
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[1/2 mark for each correct NPV {1/2 x 8 = 4}, 1/4 mark for each correct probability {1/4 x 8 = 2}]
 [1/2 mark for identifying that there are 8 possible states of the world, 1/2 for taking mid values]
 {Total till now = 4+2+1/2 + 1/2 =7 marks}

Thus the Expected NPV is given by:

$$1/6*51.74+1/4*33.55+...1/24*-25.30 = 23.4$$

[1 mark]

{Total till now = 7 +1 = 8 marks}

- Note: A1 = Success
 A2 = Failure
 B1 = good weather
 B2 = bad weather
 C1 = no strike
 C2 = strike

Comments: {maximum 3 marks}

The expected NPV is positive, suggesting that the project should be undertaken (all else being equal) [1 mark]

The actual NPV is positive with a probability of 3/4. [1/2 mark]

The most critical of the three risk facing the project is that of low tolls, which has the greatest impact upon the expected NPV and hence the success of the project. The difference between the expected NPVs with low and high tolls is equal to 45.2. [1 mark even if the difference is not mentioned in figures]

The NPV is always positive if the toll revenue is high (equal to 45) [1/2 mark]

Bad weather is probably the most important risk, as two of the three negative results- the two worst results in fact- arise when the weather is bad. In fact, bad weather reduces the expected NPV by an amount equal to either 18 or 22. Conversely, a strike reduces the expected NPV by either 10 or about 13.6. [1 mark even if figures are not reported or even if strike is not mentioned. Conversely, if only strike is mentioned without weather being mentioned and it is identified as third important factor then 1/2 mark.]

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Strategies that could be considered

1. No dividend over the period of the restructuring. This might be appropriate if the problems are at the core of the business and there is no guarantee that former levels can be attained again in the future.
2. Continue paying the dividend at the former level in the anticipation that profits will recover to this level again. If the management is confident that the current problems are short lived and not core to business, then this could be the optimal choice.
3. Pay a scrip dividend rather than a cash dividend. If cash flow is a problem, but the level of dividend can be justified at its former level, then this would be a solution.

[1 mark for each strategy which would be split as ½ for the strategy and ½ for the rationale.]

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The manipulation may involve inflating current operating income (via an increase in booked sales or a decrease in expenses) or reducing current operating income (in order to increase future earnings). The latter may be encouraged by the use of the executive incentives linked to future performance. [1 mark for identifying that manipulation may be to increase current or future profits]

Accounting practices that can lead to such misstatements include:

1. Inappropriate depreciation of tangible assets.
There are various choices available like written down value or straight line method and also the rate of depreciation to be used. High depreciation would boost future earnings and vice versa.
2. Inappropriate amortization of intangible assets.
This is similar to depreciation of tangible assets.
3. Inappropriate valuation of stocks & inventories.
Stocks and inventories may be valued using LIFO, FIFO, Average Stock Method, etc. Depending on the inflation environment, the choice of method would either increase or decrease the current profit.
4. Inappropriate valuation of future liabilities.
Future liabilities may be valued either very conservatively or optimistically impacting the current profits. This is more important for companies having long term liabilities like life insurance companies.
5. Unwarranted revaluation of tangible assets.
Revaluation of existing assets may be carried out to reflect the market boom/recession so that current period profit is increased / decreased.
6. Creating intangible assets of questionable true worth.

Intangible assets may be created with high/low value which may increase/decrease the profits.

7. Omitting contingent liabilities.

Contingent liabilities may need to be valued and by omitting/ decreasing/ increasing such liabilities the company may increase/decrease the current period profits.

8. “pre booking “ of anticipated sales value.

Pre-booking of sales would inflate the current period revenue and hence profits.

[Maximum marks 6 for this part.]

[1 mark for each of the point. Give marks for maximum of 6 points.]

[The 1 mark would be split as $\frac{1}{4}$ for the heading and $\frac{3}{4}$ for the explanation]

14

Agency theory considers the relationship between a principal and an agent of that principal and includes issues such as the nature of the agency costs, conflict of interest (and how to avoid them) and how agents may be motivated and incentivised. [2 marks:- no part marking in this portion]

Example: The relationship between the shareholders and the management. The shareholders are the principal who theoretically own the company. It is possible that there may be large number of shareholders each holding a very small stake. Under such a situation, usually the company would be managed by professional managers who may not be the shareholders of the company or even if they own shares, the holding would be very small. They would not be running the company as owners as they would not own large portion of shares. In such a situation, it is possible that they may try to increase their salary and other perks as this would go to them directly rather than increasing the profit of the company, which would be shared with large number of other shareholders. This gives rise to the conflict of interest. The management may take actions which would benefit them more than the shareholders. [1.5 marks - Any other suitable example may also be considered.]

Divergence of interests leads to the possibility of conflicts of interests. So the solution may relate to motivating the managers to take decisions in the interest of the shareholders. There are two factors that encourage managers to operate in the interests of the shareholders: job security and remuneration packages. Firing of management for bad performance may be one solution. Effective implementation of this option would depend on effectiveness in communication of performance goals. Another solution may be to provide a proportion of salary / perks in the form of stock options. The value of call option would be positively related to the share price which in turn, will be related to the firm's performance. So to maximise their wealth, the management may act in the interest of shareholders, as share price maximization would lead to increase in their personal wealth. [1.5 marks]

15.

Profit & Loss Account for the year ended 31 March 2005

		Rs. 000	Rs. 000
Sales			1175
Closing stock			8
Cost of sales:			
Opening stock		6	
Purchases		502	
Depreciation :			
Building		91	
Plant & Machinery		132	
Salary		112	
Rent & rates		100	(943)
Gross profit			240
Expenses:			
Administrative expenses		45	(45)
Operating profit			195
Interest			(65)
Net profit before tax			130
Tax			(26)
Net profit after tax			104
Dividends			(17)
Retained profit			87
Profit & loss brought forward			160
Profit & loss carried forward			247

[Total max. 5 marks.

3 marks for correct answer up to operating profit otherwise 0;

2 marks for correct answer of profit & loss carried forward otherwise no marks;

no part marking (either 5 or 3 or 2 or 0)]

Balance Sheet as at 31st March 2005

		Rs. 000	Rs. 000
Fixed Assets			
Land & Building- cost		1300	
Plant & Machinery-cost		800	
Depreciation		(558)	1542
Current Assets			
Cash		12	
Stock		8	
Debtors		<u>245</u>	265

Current Liabilities			
	Creditors	187	
	Tax provisions	26	
	Dividend payable	17	(230)
Net current assets			<u>35</u>
Long term liabilities			
	Loan		(450)
Total assets Less outsiders liabilities			<u>1127</u>
Share capital and reserves:			
	Share capital	700	
	Share premium	180	
	Profit & Loss	247	<u>1127</u>

[Total max. 5 marks.

1 marks for total correct fixed assets figure,

1 for total correct current assets,

1 mark for total current liabilities,

2 mark for total of both sides of balance sheets matches with the answer.]

Notes:

- 1) building depreciation: $20\% (555-100)=91$
- 2) Plant & Machinery Dep : $20\% (800-140)=132$
- 3) Total depreciation = $195+140+91+132$

[½ mark for the calculation of dep. on building and ½ mark for the calculation of dep. on plant & machinery.]

[1 mark for the neatness,

2 mark for the correct format of P.& L. A/C and Balance Sheet]

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The accounting concepts are:

1. The cost concept (historical cost)
2. The money measurement concept
3. The business entity concept
4. The realization concept
5. The accrual concept
6. The dual aspect concept
7. The materiality concept
8. The prudence concept
9. The going concern concept
10. Consistency concept

[Maximum 2 marks for listing with ¼ mark for each point above]

[No marks for description given for point number 1 and 7]

[1 mark for each description and maximum 3 marks]

The money measurement concept

Accounting statements can be measured objectively in money terms. It will exclude items like value of the company's customer base, its work force, its brand name etc.

The business entity concept

The affairs of the business are kept separate from those of the owners.

The realization concept

Income is recognized as and when it is "earned". It is not, therefore, necessary to wait until the customer settles his bill.

The accrual concept

Expenses are recognized as and when they are incurred, regardless of whether or not the amount has been paid.

The dual aspect concept

This concept recognizes that every transaction will affect two figures. This concept forms the basis for the double entry book keeping system.

The prudence concept

The preparers of the financial statement should avoid presenting an unduly optimistic set of results. Prudence should only be applied in situations when there is uncertainty.

The going concern concept

It is assumed that a business will continue indefinitely in its present form.

Consistency concept

The figures published by the company should be comparable from one year to the next. Accounting policies should not, therefore, be changed from one year to the next unless there is a very good reason for doing so.

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Complications of insurance company accounts

The preparation of insurance company accounts is complicated by two special features:

1. The underlying contracts (liabilities) fall due outside the accounting period and are uncertain in size.

2. Premature transfer of profits to shareholders may endanger the financial stability of the company and the ability to meet future liabilities.

[1 for each of the above points = 2 marks]

[Maximum 3 marks for the part given below]

Estimates of the future liabilities have to be made, either on a statistical basis, based on past experience, or by expert judgment. [1/2]

These estimates are frequently reviewed and updated in the light of claims experience. [1/2]

Premiums already received in respect of such liabilities need to be identified and held until such time as the liabilities have expired. [1/2]

Insurance companies are likely to adopt a prudent approach to the estimation of their liabilities, and since these reserves are entered as a cost in the profit & loss account, their profits are likely to be understated. [1/2]

This conflicts with the basic principle that the accounts should give a true & fair view of the state of the company. [1/2]

There is an additional problem caused by the long term nature of the business. New business initially causes a financial strain due to the cost of setting up the contracts and establishing adequate initial reserves. However, overtime, the product is designed to make a profit for the business. The question arises as to when and how this profit should be reported. [1]

The tax system might cause a further problem if particular classes of business are taxed in different ways. The company might have to set up separate sub funds for tax purpose. [1/2]

18

The basic principles of capital gains tax are given below:

1. Chargeable gains should normally fall into the tax year of assessment, during which the gain is realized so that the funds to pay the tax should be available. [1 mark]
2. Chargeable gain is typically defined as (sale price – purchase cost). The sale price may be reduced to reflect any costs associated with the sale. The purchase cost may be increased by any costs associated with the purchase. [1 mark]
3. Indexation allowance may be provided further to remove the capital gains due to general inflation and hence to reduce the tax liability. [1 mark]
4. Capital losses may be offset against capital gains in the same year. Any “unused” capital loss may be carried forward to be offset against capital gains in any future years. [1 mark]
5. The rules for offsetting capital losses do not apply if the loss is only caused by the indexation allowance. [1 mark]
6. The tax rates may be different for capital gains or may be the marginal tax rate after clubbing the resulting gain with the total income. The tax rate method may be different for individual and corporate. [1 mark]

[Maximum 5 marks]

19 i)

An interest rate swap would be the most appropriate form of derivative. [1 mark]

The company will agree to pay to a second party, a regular series of fixed amounts for the five year period. In exchange, the company would receive from the second party a series of variable amounts based on the level of a short term interest rate. This can be used to service the floating rate loan. [2 mark]

The fixed payment can be thought of as interest payments on a deposit at a fixed rate, while the variable payments are the interests on the same deposit at a floating rate. The deposit is purely notional, no exchange of principal takes place. [1 mark]

19 ii)

Buying a put costs money as one has to pay premium. The benefit of buying a put is that it provides downside protection if the stock price moves down. But, the premium which one has to pay means that share price should move up more than the premium amount within the expiry time to make some money. [1 mark]

Since, it is not guaranteed that stock price will move up by that amount, you are not guaranteed to make money. However, you are guaranteed that the loss will not be more than the premium amount.

[1 mark]

20

i)

The company has no debt finance, so the WACC is equal to the cost of equity, which is given by:
risk-free return + beta X market risk premium

$$=6\% + 1.2 \times 8\% = 15.6\% \quad [1 \text{ mark}]$$

Year	0	1/2	1 1/2	2 1/2	3 1/2
Cashflow	(30)	(5)	4	12	37
PV @ 15.6%	-30	-4.6504	3.21828	8.35193	22.2766

NPV = -0.8036 Crore

[2 marks= 1 mark for identifying correct cash-flows with the correct time + 1 mark for correct NPV computation]

ii)

Advantages of using WACC

- Using the same cost of capital across an entire business leads to fewer internal problems.

- It is easy and quick.
- It reflects the overall risks in the company's existing portfolio of projects.

[2 Marks]

Disadvantages of using WACC

- The project may be riskier than other projects in the company's portfolio. In particular it may have more systematic risk than the average project. It should be evaluated using an appropriate return to reflect the higher beta for the project.
- The investor's expectations will change when this large project is added to the portfolio, thus the overall WACC will change.

[2 Marks]

iii) IRR (by interpolation)

We have an NPV of -0.80 Cr at 15.6%. Recalculating at 14% gives an NPV of 0.64 Cr. Therefore,

$$\text{IRR} = 14\% + 0.64 / (0.64 + 0.80) * 1.6\% = 14.71\% \quad [1 \text{ mark}]$$

Checking this answer: NPV at above rate is -0.01 Crore.

iv)

The company currently has equity shares with a market value of $30 \times 105 = 3150$ Crore. The suggested capital structure would leave the company with 1000 Cr of debt and 2150 Crore of equity.

Debt is clearly perceived as risk free as the interest rate matches with the risk free rate. [1 mark]

To calculate new beta of the ordinary shares we can use:

$$\begin{aligned} \text{Geared beta} &= \text{Un-geared beta} \times (1 + \text{debt/equity} \times (1 - \text{tax rate})) \\ &= 1.2 \times (1 + 100 / 215 * 0.7) = 1.59 \quad [\frac{1}{2} \text{ mark}] \end{aligned}$$

The return required by equity shareholders would then be $6\% + 1.59 * 8\% = 18.73\%$ [½ mark]

Thus the WACC = $(1000 * 6\% * 0.7 + 2150 * 18.73\%) / 3150 = 14.11\%$ [1 mark]

This is below the IRR for the project. Therefore, the project would have a positive NPV at the new WACC for the company. This makes the project more viable. [1]

v)

The company could perform any of the following sensitivity tests:

- The effect on the NPV, if the anticipated selling price of each house is reduced by 10% [1]
- The effect on the NPV, if the anticipated raw material cost is increased by 10% [1]

- The effects of a half year delay in all cash-flows, caused by construction problems. [1]

[Maximum 2 marks.

Mark may be awarded for other valid points.]

vi)

Shareholder value analysis

- Analyse what investors appreciate about equity investments in general and the shares of this company in particular. [½ mark]
- This might be a low PE, a high cash-flow, a low beta, high gearing etc. [½ mark]
- Calculate the current values of these factors and then model the company including the new project, paying close attention to the effect on the factors that are most important to investors (and paying less attention to those factors that are deemed not important to investors) [½ mark]
- Adopt or reject the project on the basis of the extent to which it adds shareholder value. [½ mark]

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The factors that may be considered are:

- 1) the need for finance and the amount of finance I can contribute
- 2) the ease of raising finance in the future
- 3) liability for debts
- 4) ease of setting up
- 5) disclosure requirements
- 6) control of the business
- 7) roles and responsibilities
- 8) the type of business

[½ for each, maximum 3]