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# Answers

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Section C

31 Tufa Co

(a) Cost of equity

Cum div share price (\$ per share)	7.52	
Ex div share price (\$ per share)	7.07	
Dividend for 20X7 (\$ per share)	0.45	
Dividend for 20X3 (\$ per share)	0.37	
Dividend growth rate (%)	5.02	$[(0.45/0.37)^{0.25} - 1]$
Cost of equity (%)	11.7	$[(0.45 \times 1.05)/7.07] + 0.05$

Cost of preference shares

Nominal value (\$ per share)	0.50	
Market price (\$ per share)	0.31	
Dividend rate (%)	5	
Cost of preference shares (%)	8.06	$[(0.5 \times 0.05)/0.31]$

Interest rate of loan notes (%)	7
Nominal value of loan notes (\$)	100.00
Market price of loan notes (\$)	102.34
Time to redemption (years)	4
Redemption premium (%)	5
Tax rate (%)	30

Year	Item	\$	5% DF	PV (\$)	6% DF	PV (\$)
0	MV	(102.34)	1.000	(102.34)	1.000	(102.34)
1-4	Interest	4.90	3.546	17.38	3.465	16.98
4	Redeem	105.00	0.823	86.42	0.792	83.16
				<u>1.45</u>		<u>(2.20)</u>

IRR (%)  $(5 + (1.45/(1.45 + 2.20))) = 5.40$

Cost of bank loan (%) 5.40 Use cost of loan notes as a proxy value.

Market values and WACC calculation

	BV (\$000)	Nominal	MV	MV (\$000)	Cost (%)	WACC
Ordinary shares	12,000	0.50	7.07	169,680	11.7	10.67
Preference shares	5,000	0.50	0.31	3,100	8.06	0.13
Loan notes	10,000	100.00	102.34	10,234	5.40	0.30
Bank loan	3,000			3,000	5.40	0.09
				<u>186,014</u>		<u>11.19</u>

- (b) The current WACC of Tufa Co represents the mean return required by the company's investors, given the current levels of business risk and financial risk faced by the company.

The current WACC can be used as the discount rate in appraising an investment project of the company provided that undertaking the investment project does not change the current levels of business risk and financial risk faced by the company.

The current WACC can therefore be used as the discount rate in appraising an investment project of Tufa Co in the same business area as current operations, for example, an expansion of current business, as business risk is likely to be unchanged in these circumstances.

Similarly, the current WACC can be used as the discount rate in appraising an investment project of Tufa Co if the project is financed in a way that mirrors the current capital structure of the company, as financial risk is then likely to be unchanged.

The required return of the company's investors is likely to change if the investment project is large compared to the size of the company, so the WACC is likely to be an appropriate discount rate providing the investment is small in size relative to Tufa Co.

- (c) The following advantages of using convertible loan notes as a source of long-term finance could be discussed.

Conversion rather than redemption

If the holders of convertible loan notes judge that conversion into ordinary shares will increase their wealth, conversion of the loan notes will occur on the conversion date and Tufa Co will not need to find the cash needed to redeem the loan notes. This is sometimes referred to as 'self-liquidation'.

### Lower interest rate

The option to convert into ordinary shares has value for investors as ordinary shares normally offer a higher return than debt. Investors in convertible loan notes will therefore accept a lower interest rate than on ordinary loan notes, decreasing the finance costs for the issuing company.

### Debt capacity

If Tufa Co issued convertible loan notes, its gearing and financial risk will increase and its debt capacity will decrease. When conversion occurs, its gearing and financial risk will decrease and its debt capacity will increase because of the elimination of the loan notes from its capital structure. However, there will a further increase in debt capacity due to the issue of new ordinary shares in order to facilitate conversion.

### Attractive to investors

Tufa Co may be able to issue convertible loan notes to raise long-term finance even when investors might not be attracted by an issue of ordinary loan notes, because of the attraction of the option to convert into ordinary shares in the future.

### Facilitates planning

It has been suggested that an issue of fixed-interest debt such as convertible loan notes can be attractive to a company as the fixed nature of future interest payments facilitates financial planning.

## 32 Pelta Co

(a) (i) Year	1 \$000	2 \$000	3 \$000	4 \$000	5 \$000
Sales income	16,224	20,248	24,196	27,655	
Variable costs	(5,356)	(6,752)	(8,313)	(9,694)	
Contribution	10,868	13,495	15,883	17,962	
Fixed costs	(700)	(735)	(779)	(841)	
Cash flow before tax	10,168	12,760	15,104	17,121	
Corporation tax		(3,050)	(3,828)	(4,531)	(5,136)
TAD tax benefits		1,875	1,406	1,055	2,789
After-tax cash flow	10,168	11,585	12,682	13,644	(2,347)
Terminal value				1,250	
Project cash flow	10,168	11,585	12,682	14,894	(2,347)
Discount at 12%	0.893	0.797	0.712	0.636	0.567
Present values	9,080	9,233	9,030	9,473	(1,331)
PV of future cash flows (\$000)		35,485			
Initial investment (\$000)		(25,000)			
NPV		10,485			

### Workings

Year	1	2	3	4
Sales volume (units/year)	520,000	624,000	717,000	788,000
Selling price (\$/unit)	30.00	30.00	30.00	30.00
Inflated by 4% per year	31.20	32.45	33.75	35.10
Income (\$000/year)	16,224	20,248	24,196	27,655

Year	1	2	3	4
Sales volume (units/year)	520,000	624,000	717,000	788,000
Variable costs (\$/unit)	10.00	10.20	10.61	10.93
Inflated by 3% per year	10.30	10.82	11.59	12.30
Variable costs (\$000/year)	5,356	6,752	8,313	9,694

Year	1	2	3	4
Fixed costs (\$000 per year)	700	735	779	841

Year	1	2	3	4
TAD (\$000 per year)	6,250	4,688	3,516	9,297
TAD benefits (\$000/year)	1,875	1,406	1,055	2,789

(ii) Year	1	2	3	4	5
	\$000	\$000	\$000	\$000	\$000
Present values	9,080	9,233	9,030	9,473	(1,331)
Cumulative net present value	(15,920)	(6,687)	2,343	11,815	10,485
Discounted payback (years)		2.7 (2 + (6,687/9,030))			

- (b) The investment project is financially acceptable under the NPV decision rule because it has a substantial positive NPV.

The discounted payback period of 2.7 years is greater than the maximum target discounted payback period of two years and so from this perspective the investment project is not financially acceptable.

The correct advice is given by the NPV method, however, and so the investment project is financially acceptable.

- (c) The views of the directors on investment appraisal can be discussed from several perspectives.

#### **Evaluation period**

Sales are expected to continue beyond year 4 and so the view of the directors that all investment projects must be evaluated over four years of operations does not seem sensible. The investment appraisal would be more accurate if the cash flows from further years of operation were considered.

#### **Assumed terminal value**

The view of the directors that a terminal value of 5% of the initial investment should be assumed has no factual or analytical basis to it. Terminal values for individual projects could be higher or lower than 5% of the initial investment and in fact may have no relationship to the initial investment at all.

A more accurate approach would be to calculate a year 4 terminal value based on the expected value of future sales.

#### **Discounted payback method**

The directors need to explain their view that an investment project's discounted payback must be no greater than two years. Perhaps they think that an earlier payback will indicate an investment project with a lower level of risk. Although the discounted payback method does overcome the failure of simple payback to take account of the time value of money, it still fails to consider cash flows outside the payback period. Theoretically, Pelta Co should rely on the NPV investment appraisal method.

	<i>Marks</i>	<i>Marks</i>
<b>Section C</b>		
<b>31 (a)</b> Dividend for 20X7	1	
Dividend growth rate	1	
Cost of equity	1	
Cost of pref shares	1	
After-tax interest	1	
Kd calculation setup	1	
Calculating Kd	1	
Cost of bank loan	0.5	
MV ordinary shares	0.5	
MV pref shares	0.5	
MV loan notes	0.5	
WACC calculations	<u>2</u>	
		11
<b>(b)</b> Business risk	1	
Financial risk	1	
Size of investment	<u>1</u>	
		3
<b>(c)</b> First advantage	2	
Second advantage	2	
Third advantage	<u>2</u>	
		<u>6</u>
		<b><u>20</u></b>
<b>32 (a) (i)</b> Inflated sales	1	
Inflated VC/unit	1	
Inflated total VC	1	
Tax liabilities	1	
TAD benefits yrs 1–3	1	
TAD benefits yr 4	1	
Timing of tax flows	1	
Terminal value	1	
Calculate PVs	<u>1</u>	
		9
<b>(ii)</b> Cumulative NPV	1	
Discounted payback	<u>1</u>	
		2
<b>(b)</b> Acceptability – NPV	1	
Acceptability – Payback	1	
Correct advice	<u>1</u>	
		3
<b>(c)</b> Evaluation period	2	
Terminal value	2	
Discounted payback	<u>2</u>	
		<u>6</u>
		<b><u>20</u></b>



# F9 Examiner's commentary on September/December 2017 sample questions

This commentary has been written to accompany the published sample questions and answers and is written based on the observations of markers. The aim is to provide constructive guidance for future candidates and their tutors, giving insight into what the marking team is looking for, and flagging pitfalls encountered by candidates who sat these questions.

## **Question 31(a)**

This question required candidates to calculate the after-tax weighted average cost of capital (WACC) of the company, where there were four distinct sources of finance. Hence, all four elements needed to be considered, and a separate cost and value calculated for each.

Attempts at calculating the cost of equity and the value of ordinary shares were generally good. Some candidates were not able to calculate the current dividend as the difference between the cum div and ex div share prices, nor were they able to recognise that there were four years of dividend growth. Most candidates were, however, able to perform correctly a dividend growth rate computation.

Correct calculations of the cost of capital of preference shares were disappointingly low in number. Too many candidates made errors such as using an 'after tax' preference dividend or appeared to be simply guessing at the combination of figures that needed to be used.

Using an IRR approach to calculate the after tax cost of loan notes was generally done well. Errors in calculation included not using after tax interest in the IRR calculation, not including the redemption value of the loan note at its stated premium and/or using nominal value as the purchase price of loan notes rather than market value.

Omissions of the cost of the bank loan, and indeed its value, due to it 'having a variable rate' were common, but in error. The bank loan was part of the total finance of the company and needed to be included by using an appropriate substitute value for its cost, such as the after-tax cost of debt of the loan notes or the after-tax interest rate of the loan notes.

Good examination technique here was for candidates to present the cost and value of the four sources of finance as four separate workings and then to calculate the WACC by clearly showing its four elements. Some candidates were combining sources of finance and this led to errors. Examples of this were treating preference shares as ordinary shares and treating the bank loan as loan notes.

The question asked for the WACC on a market value basis, hence using book values instead of market values as weightings is simply incorrect.

**Question 31(b)**

Here candidates were required to discuss the circumstances where it is appropriate to use the WACC in appraising an investment project. Some candidates discussed all three of the required circumstances, including an explanation of what is meant by business risk and financial risk. However, too many responses simply said “the WACC can be used if business risk and financial risk are unchanged” without further development. Whilst correct, the statement needs further discussion. A minority of responses made the point about the new investment needing to be small in relation to the company.

The key to answering a question such as this is to focus clearly on the requirement. Indeed, a common mistake in this question at this diet was to discuss circumstances under which it was not appropriate to use the current WACC and how WACC could be amended to address these circumstances. This was not what was asked.

Some answers were not even related to the requirement, discussing instead capital structure theory, or the creditor hierarchy, or pecking order theory, to name just some. There were also a disappointing number of candidates marking no attempt at this part question.

**Question 31(c)**

This question required candidates to discuss three advantages to the company of using convertible loan notes as a source of long-term finance.

Better candidates broke down this requirement and addressed its component parts.

Firstly, a discussion is asked for. If six marks are offered for discussing three advantages, then assuming that two marks are offered for each advantage is reasonable. A ‘bullet point’ or short phrase is rarely, if ever, going to be sufficient to attract the two marks available for an advantage.

Secondly, if three advantages are required, then discussing a fourth or even fifth advantage is both poor examination technique and poor time management.

Thirdly, the question was clearly asked from the viewpoint of the user of the finance, which was a company listed on a large stock exchange, and not the providers of the finance. Better responses understood this important difference of viewpoint.

Fourthly, when answering a question like this, there is a tendency for candidates to write all they know about the topic or to write in general terms about one of the areas, without focusing precisely on the specific requirements of the question. Here the requirement was about a specific type of debt finance, convertible loan notes, and the candidate’s answer should have addressed that type of finance precisely.

Weaker responses ignored the possibility of conversion and were related only to the debt or non-equity nature of the loan notes e.g. debt is cheaper than equity or interest on debt is tax deductible. Some answers thought that conversion was a choice exercised by the company, rather than the investor and other answers assumed that conversion was automatic, rather than a wealth-maximising decision made by investors.

### Question 32(a)(i)

This question asked candidates to calculate the NPV of an investment project, considering taxation and inflation.

Candidates have continued to do well on investment appraisal questions requiring NPV calculations, with candidates gaining good marks here, including many with full marks.

That said, a recurring error in the cash flow workings is a failure to apply a 'per year inflation rate' correctly. If an inflation rate of 3% per year needs to be applied to a variable cost per unit, then by the end of year 3, the given variable cost per unit needs to be inflated three times i.e. by  $1.03^3$ .

A number of answers to this question used an incorrect discount rate, usually the real discount rate, to discount the nominal values already calculated.

Other errors seen quite often included:

- incorrectly placing initial investment at year 1 rather than year 0
- incorrectly placing the terminal value at year 5 rather than year 4, or not including it altogether
- not placing tax-related cash flows one year in arrears
- omitting the tax-related cash flows in year 5
- not calculating a balancing allowance, or calculating a balancing allowance but not adjusting it for the scrap value of the asset

### Question 32(a)(ii)

This requirement to calculate the discounted payback period of the project was done well, with many candidates scoring the two marks on offer.

Where errors were made, they included a recalculation of the present values from (a)(i) by erroneously using the real discount rate or using cash flows before tax.

Even on a two mark part question such as this, in Section C it is still good examination technique for candidates to show all workings, such as the calculation of cumulative NPV and how the part year element of the discounted payback period has been calculated.

### **Question 32(b)**

Here candidates were asked to discuss the financial acceptability of the investment project. Three marks were available.

Most candidates were able to refer to the decision rules relevant to net present value and discounted payback, but do need to justify financial acceptability comments. Standalone comments such as 'Accept' or alternatively 'Positive NPV' should be explained as should 'more than 2 years' in respect of the discounted payback period.

In this question, there was a conflict between the two methods regarding acceptability, therefore candidates needed to refer to the respective investment appraisal methods and conclude by asserting the superiority of one method (NPV) over the other (discounted payback).

Weaker responses simply referred to the positive NPV calculated in (a)(i), which is insufficient for a part question worth three marks.

### **Question 32(c)**

This question asked candidates to critically discuss the views of the directors in respect of the company's investment appraisal. These views were concerned with the evaluation period of projects, an assumed terminal value and the investment appraisal techniques to be used, including a strict two year discounted payback period (DPB).

Responses demonstrated that, whilst candidates can produce very good NPV computations and calculate (discounted) payback periods correctly, improvement is required when it comes to discussion.

This question asked candidates to critically discuss viewpoints. It is rarely sufficient to simply list a few points. A critical discussion should involve looking at a viewpoint or a statement in more than one way, for instance by looking at both its good aspects and those aspects which could be criticised.

Many candidates simply ignored the directors' view on terminal value. Other errors included saying that NPV considered the whole life of an investment project, even though the directors had limited NPV's application to four years. Also, too many answers said that payback failed to take account of the time value of money, even though the directors required DPB to be used.

Some answers assumed that the investment project ended after four years, when in fact the directors simply required that only the first four years be evaluated using NPV.

Too many answers failed to directly address the question requirement, often offering a discussion of investment appraisal in general rather than the directors' views specifically, whilst poor answers did not address the question requirement by discussing only forecasting problems, such as difficulties in forecasting cash flows, inflation rate, changes in the cost of capital etc.