# CIMA

### Financial Management Pillar Strategic Level Paper P9 – Management Accounting – Financial Strategy

### 21 November 2007 – Wednesday Morning Session

### Instructions to candidates

You are allowed three hours to answer this question paper.

You are allowed 20 minutes reading time **before the examination begins** during which you should read the question paper and, if you wish, highlight and/or make notes on the question paper. However, you will **not** be allowed, **under any circumstances**, to open the answer book and start writing or use your calculator during the reading time.

You are strongly advised to carefully read ALL the question requirements before attempting the question concerned (that is all parts and/or subquestions). The question requirements are highlighted in a dotted box.

ALL answers must be written in the answer book. Answers or notes written on the question paper will **not** be submitted for marking.

Answer the ONE compulsory question in Section A on pages 2 to 5. The question requirements are on page 5, which is detachable for ease of reference.

Answer TWO questions only from Section B on pages 8 to 14.

Maths Tables and Formulae are provided on pages 17 to 21. These pages are detachable for ease of reference.

The list of verbs as published in the syllabus is given for reference on the inside back cover of this question paper.

Write your candidate number, the paper number and examination subject title in the spaces provided on the front of the answer book. Also write your contact ID and name in the space provided in the right hand margin and seal to close.

Tick the appropriate boxes on the front of the answer book to indicate which questions you have answered.

Financial Strategy

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### SECTION A - 50 MARKS

[the indicative time for answering this Section is 90 minutes]

## ANSWER THIS QUESTION. THE QUESTION REQUIREMENTS ARE ON PAGE 5, WHICH IS DETACHABLE FOR EASE OF REFERENCE

### **Question One**

### PT group

The PT group is based in Germany and operates mail, express courier and air and ocean freight services worldwide. Its customers and operations are largely centred in Europe, but the group also operates in North America and Asia/Pacific. Currently, the largest growth area is in China, which is experiencing rapid economic development in all areas and requires increased use of express mail and freight services to support that growth.

The key financial objectives of the PT group are as follows:

- to increase group earnings by an average of 10% per annum over the next three years;
- to increase earnings per share to above 110 cents within three years;
- to maintain a gearing ratio (long-term borrowings/long-term borrowings plus equity) of less than 40%.

Based on current information available about the PT group in its present form:

- group earnings are expected to increase by a compound average of 9.4% per annum over the next three years;
- earnings per share are expected to rise to 91 cents within three years;
- gearing is expected to remain below 40%.

The PT group also has publicised the following strategic objectives:

- modernise its IT and distribution network in order to improve customer service;
- increase its worldwide coverage, particularly in rapidly growing economies of the world such as China.

The Directors of PT group are considering making an acquisition on 31 December 2007 which would help to improve its growth prospects. The Directors have been approached by the Directors of ITPT, a courier service based in Italy, who consider it to be in the best interests of the ITPT shareholders for ITPT to merge with a larger entity to take advantage of the increasing globalisation of the courier market.

### ITPT

ITPT operates a courier service across Italy and neighbouring European countries in the eurozone. ITPT has an excellent reputation in terms of reliability and speed of delivery as well as for its efficient and friendly customer service. It is supported by an efficient, modern IT and distribution operation.

Competitive pricing has also helped promote the rapid growth of the business, with earnings increasing by an average of 12% per annum in recent years. However, such a high level of growth is not considered to be sustainable indefinitely.

### Proposed opening bid price and alternative bid structures

An opening bid of €2,500 million has been proposed by the Directors of the PT group on the basis of estimated synergistic savings of the order of €60 million per annum from merging the distribution networks of the two entities.

The bid is to be structured as either:

- a cash offer of €2,500 million; or
- a share-for-share offer worth €2,500 million at the PT group's current share price.

Mr A, a Director of the PT group, has suggested that all, or part, of the cost of the cash offer could be financed by the PT group by a reduction in dividend payments.

## Financial information for the individual entities, before taking into account the proposed acquisition

Summary forecast balance sheet at 31 December 2007	PT group €million	ITPT €million
ASSETS		
Non-current assets		
Property, plant and equipment (book values)	8,626	1,021
Intangible assets	7,270	0
Current assets		
Inventories	226	42
Receivables	5,867	815
Cash and cash equivalents	635	72
	22,624	1,950
EQUITY AND LIABILITIES Equity		
Issued capital (€1 ordinary shares)	1.012	300
Reserves	7.970	477
Non-current liabilities	,	
Long-term borrowings (floating rate)	2,180	675
Provisions	5,478	0
Current liabilities	5,948	498
	22,624	1,950
Other key financial data at 31 December 20	07	
Share price	<i>€</i> 4.80	€7.80
Earnings per share *	69.5 cents	78.0 cents
Dividend per share	29.0 cents	34.0 cents
Cost of equity	15%	13%
Current interest rate on borrowings	10%	10%
Tax rate	20%	20%
Forecast earnings for the years ended	€million	€million
31 December 2008	766·9	262.1
31 December 2009	839·2	293.5
31 December 2010	921.1	328.8

\* (100 cents = €1)

The question continues, with its requirements, on page 5, which is detachable for ease of reference.

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### **Continued from Page 3**

### Additional information for ITPT:

- Annual growth in earnings is expected to fall to 5% per annum from 2011 onwards;
- A consistent dividend payout ratio will be maintained;
- Property, plant and equipment current replacement value is estimated as €1,500 million;
- Average return on net tangible assets over the last three years was 20%;
- Average year end net tangible assets over the last three years was €1,300 million;
- Courier industry average return on net tangible assets in the last three years was 12%;
- Courier industry average cost of capital is 15%.

Note: Net tangible assets are at book values.

 R	 Requir	red:	
(a)	Calc	ulate a range of values at 31 December 2007 for:	
	•	the intangible assets of ITPT; and	
	•	the total value of ITPT;	
	and	briefly interpret the significance of each result.	(15 marks)
(b)	As a the p	n external consultant engaged by the Directors of the PT group to proposed acquisition of ITPT, write a report which covers the follow	advise on ving issues:
	(i)	advise whether the proposed bid price of €2,500 million appears	s to be
			(4 marks)
	(ii)	evaluate whether the acquisition of ITPT would help the PT groustated financial objectives for each of the two alternative bid strues	up to meet its uctures. <i>(12 marks)</i>
	(iii)	advise how best to structure and finance the bid offer, including of Mr A's suggestion that part, or all, of the cost of a cash offer of financed by a reduction in dividend payments, rather than borrow (no additional calculations are required in part (iii))	a discussion could be wings.
			(8 marks)
	(iv)	discuss the broader strategic implications of the proposed acqui and recommend whether or not to proceed.	isition of ITPT
			(7 marks)
		Additional marks for structure and presentation	(4 marks)
		(Total for Question One	e = 50 marks)

End of Section A. Section B starts on page 8.

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Section B starts on page 8

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### SECTION B - 50 MARKS

[the indicative time for answering this Section is 90 minutes]

ANSWER TWO ONLY OF THE FOUR QUESTIONS

### **Question Two**

ABC is an entity based in the UK with diverse international interests. Its shares and debenture stock are quoted on a major international stock exchange.

ABC is evaluating the potential for investment in the production and distribution of films, an area in which it has not previously been involved. This investment will require £600 million to purchase premises, equipment and provide working capital. An alternative approach would be to acquire a small entity in this field, but a preliminary search has revealed none suitable.

Extracts from the most recent balance sheet of ABC are shown below:

	£million
ASSETS Non-current assets Current assets EQUITY AND LIABILITIES	1,920 <u>1,880</u> <u>3,800</u>
<b>Equity</b> Share capital (Shares of £1) Retained earnings	300 <u>1,000</u> 1,300
Non current liabilities 8·4% Secured debenture repayable 2012	1,100
Current liabilities	1,400 <u>3,800</u>
Current share price (pence) Debenture price (£100) Equity beta	800 105 1·2

ABC proposes to finance the £600 million investment with a combination of debt and equity as follows:

- £260 million in debt paying interest at 8% per annum, secured on the new premises and repayable in 2014;
- £340 million in equity via a rights issue. A discount of 15% on the current share price is likely.

A marginally positive NPV of the proposed investment has been calculated using a discount rate of 15%. This is the entity's cost of equity plus a small "premium", a rate judged to reflect the risk of this venture. The Chief Executive of ABC thinks this is too marginal and is doubtful whether the investment should go ahead. However, there is some disagreement among the Directors about how this project was evaluated, in particular about the discount rate that has been used.

**Director A:** Suggests the entity's current WACC is more appropriate.

**Director B:** Suggests calculating a discount rate using data from XYZ, a quoted entity, the main business of which is film production. Relevant data for this entity is as follows:

- Shares in issue: 400 million currently quoted at 373 pence each;
- Debt outstanding: £350 million variable rate bank loan;
- Equity beta: 1.6

#### Other relevant information

- The risk-free rate is estimated at 5% per annum and the return on the market 12% per annum. These rates are not expected to change in the foreseeable future;
- ABC pays corporate tax at 30% and this rate is not expected to change in the foreseeable future;
- Assume both ABC's and XYZ's debt has a beta of zero;
- Issue costs should be ignored.

You are a financial advisor working for ABC's bankers.

Req	uired
(a)	Discuss the appropriateness of the two Directors' suggestions about the discount rate when evaluating the proposed investment and recommend an appropriate rate to use. You should support your discussion and recommendation with calculations of two separate discount rates – one for each Director's suggestion. Show all your workings.
	(18 marks) Calculations count for up to 12 marks
(b)	Discuss how ABC's market capitalisation might change during the week the proposed investment becomes public knowledge. <b>No</b> calculations are required for this part of the question
	(7 marks)
   	A report format is <b>not</b> required for this question.
	(Total for Question Two = 25 marks)

### **Question Three**

HIJ is a private transport and distribution entity. It is considering three investment opportunities, which are not mutually exclusive. HIJ has no cash reserves, but could borrow a maximum of \$30 million at the present time at a gross interest rate of 10%. Borrowing above this amount might be possible, but at a much higher rate of interest.

The initial capital investment required, the NPV and the duration of each project is as follows:

	Initial Investment \$million	NPV \$million (after tax)	Duration Years
Project A	15.4	2.75	6
Project B	19.0	3.60	7
Project C	12.8	3.25	Indefinite

Notes:

- 1 The projects are not divisible and cannot be postponed.
- 2 The discount rate considered appropriate for all three investments is 12% net of tax.
- 3 HIJ pays corporate tax at 30%.
- 4 Assume cash flows, other than the initial investment, occur evenly throughout the duration of the investments.

### (a)

- Calculate the profitability index and equivalent annual annuities for all three projects; explain the usefulness of these methods of evaluation in the circumstances here; and recommend which project(s) should be undertaken.
   (10 marks)
- (ii) Explain the differences between "hard" and "soft" capital rationing and which type is evident in the scenario here. Discuss, briefly, the advisability of the directors of HIJ limiting their capital expenditure in this way.

(5 marks)

(iii) You later discover that the discount rate used was nominal, but the cash flows have been calculated in real terms.

Explain, briefly, how the calculation for NPV should be adjusted and what effect the changes might have and on your recommendation. You are **not** required to do any calculations for this section of the question.

(4 marks) (Total for part (a) = 19 marks)

Question Three part (b) is on the opposite page

Required
(b)
Assume that Project B, and B only, could attract Government support as follows:
<ul> <li>A non-repayable grant of \$3.5 million payable as soon as the project commenced; plus</li> </ul>
• Subsidised bank lending of 50% of the initial investment (after the government grant), secured on the non-current assets that would be acquired for this project. The capital amount of the debt would be repayable in eight years' time. Interest (before tax) is at the rate of 8% per annum and will be paid in equal instalments annually at the end of each year.
Discuss, with supporting calculations, whether this new information would change your recommendation using an APV approach incorporating the NPV in the scenario as the "base case". (Total for part (b) = 6 marks)
A report format is <b>not</b> required for this question.
(Total for Question Three = 25 marks)

### Section B continues on the next page

### **Question Four**

UVW is a manufacturer of specialist components for the motor trade. Most of the entity's business is "to order"; very little is manufactured for inventory. The components are sold to customers worldwide but, to date, have been manufactured solely in the UK. The Directors of UVW are reviewing the opportunity to establish a manufacturing base in Asia. There would be some loss of productivity, especially in the first year of operations, but the long-term cost savings would outweigh this.

Two senior managers from the UK will be sent to the Asian country to establish the overseas operation and remain there for the first 12 months. The cost of their salaries, travel and accommodation while in Asia is budgeted at £250,000 for the year.

This cost is included in the figures below.

Capital equipment purchased in UK for the As Premises and equipment purchased in Asia:	£2 million Asian \$100 million		
Operating cash flows are (Year):	One	Two	Three
Costs of Asian operation (Asian \$million)	-70.0	-65.0	-60.0
Comparable costs of UK operation (£million)	-1.5	-4.5	-4.75

Other information available:

- Assume all cash flows are after tax and that operating cash flows occur at the end of each year.
- The year three cost advantage in sterling is assumed to maintain from year four until year eight. UVW does not evaluate investments beyond eight years.
- The current spot rate is Asian \$20 to £1.
- A feasibility study has been carried out in the Asian country at a cost of Asian \$1.2 million.
- Expected inflation rate in the Asian country is 8% per annum. In the UK, it is 4% per annum. The risk free rate in the UK is 3%.
- UVW uses a discount rate of 10% for all its investment decisions.

The entity's Finance Manager does not think 10% adequately reflects the risk of this project. He believes the cost advantage of the Asian operation could fall short of the evaluated DCFs by as much as 20% in year one; 25% in year two, and 30% from year three onwards. His rough calculations suggest that, using his estimates, the project shows a substantial negative NPV.

The requirement for Question Four is on the opposite page

Requ	uired
<i>(a)</i> (i)	Calculate the sterling NPV of the project both with, and without, adjusting for certainty equivalents.
(ii)	Discuss briefly other internal factors the entity should consider before deciding whether the project should proceed. You are NOT required to discuss external economic factors or hedging techniques. Include comments on the use of certainty equivalents and why the Finance Manager's "rough calculations" might have been wrong. <i>(6 marks)</i>
	(Total for part (a) = 18 marks) Calculations count for up to 12 marks
(b)	Advise the Directors of UVW whether or not the management of working capital should be carried out in the Asian country compared with maintaining a centralised function in the UK. <i>(7 marks)</i>
	A report format is <b>not</b> required for this question.
	(Total for Question Four = 25 marks)

### **Question Five**

DEF is a telecommunications entity. It provides a variety of services to the major telecommunications operators in Europe and parts of Asia. It has been trading for 10 years and has shown spectacular growth in revenue and profits over the 10-year period, although there has been some volatility year to year. Revenue for the current year is likely to be €550 million and earnings €50 million. These figures make it one of the largest private operators, but it is still much smaller than most of its customers and its nearest publicly-listed direct rival.

DEF has been financed by equity provided by the original shareholders, many of whom still work in the entity, and by loans from banks. There are 50,000 shares currently in issue. The current debt : equity ratio is 80 : 20, using book values. No shares have changed hands over the past 10 years, so there has been no serious attempt to place a value on them. New investments are evaluated using a cost of capital of 10%, which is the average for the industry and also judged by DEF's bankers and other advisors to reflect the average business risk of DEF's operations. The average P/E for the industry is currently 14.

DEF's bankers are now suggesting an initial public offering (IPO) of DEF's shares as most European stock markets have shown strong sustained growth over the past three or four years. The shareholders are in agreement with the suggestion in principle but have asked you, DEF's Financial Manager, to advise them.

Rec	juired							
(a)	Discuss the advantages, disadvantages and challenges of pursuing an IPO in DEF's circumstances at the present time. Conclude with a recommendation.							
	Calculations are not the main purpose of this question, but credit is available for calculating some simple figures to support your discussion. <i>(9 marks)</i>							
(b)	<ul> <li>Advise on the roles that would be played by the following organisations in DEF's IPO:</li> <li>Investment bank;</li> <li>Stockbroker;</li> <li>Potential institutional investors in the issue;</li> <li>DEF's Treasury Department.</li> </ul>							
(c)	<ul> <li>(9 marks)</li> <li>The following methods of issuing shares are being suggested: <ul> <li>Private placing;</li> <li>Public offer for sale by either fixed price or tender.</li> </ul> </li> <li>Discuss the features, advantages and disadvantages of these methods and conclude with a recommendation of the preferred method of issue for DEF. (7 marks)</li> </ul>							
	A report format is <b>not</b> required for this question. (Total for Question Five = 25 marks)							

(Total for Section B = 50 marks)

End of Question Paper

Maths Tables & Formulae are on pages 17-21

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### MATHS TABLES AND FORMULAE

**Present value table** Present value of 1.00 unit of currency, that is  $(1 + r)^{-n}$  where r = interest rate; n = number of periods until payment or receipt.

Periods	Interest rates (r)									
( <i>n</i> )	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149

Periods					Interest	t rates (r)				
( <i>n</i> )	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.079	0.065
16	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.071	0.062	0.054
17	0.170	0.146	0.125	0.108	0.093	0.080	0.069	0.060	0.052	0.045
18	0.153	0.130	0.111	0.095	0.081	0.069	0.059	0.051	0.044	0.038
19	0.138	0.116	0.098	0.083	0.070	0.060	0.051	0.043	0.037	0.031
20	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026

### Cumulative present value of 1.00 unit of currency per annum

Receivable or Payable at the end of each year for *n* years  $\left[\frac{1-(1+r)^{-n}}{r}\right]$ 

						L				
Periods		Interest rates (r)								
( <i>n</i> )	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201
19	17.226	15.679	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.878	13.590	12.462	11.470	10.594	9.818	9.129	8.514

Periods		Interest rates (r)								
( <i>n</i> )	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	7.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675
16	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812
19	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870

### FORMULAE

#### Valuation models

(i) Irredeemable preference shares, paying a constant annual dividend, d, in perpetuity, where  $P_0$  is the ex-div value:

$$P_0 = \frac{d}{k_{\text{pref}}}$$

(ii) Ordinary (equity) shares, paying a constant annual dividend, d, in perpetuity, where  $P_0$  is the ex-div value:

$$P_0 = \frac{d}{k_1}$$

(iii) Ordinary (equity) shares, paying an annual dividend, d, growing in perpetuity at a constant rate, g, where  $P_0$  is the ex-div value:

$$P_0 = \frac{d_1}{k_e - g}$$
 or  $P_0 = \frac{d_0[1 + g]}{k_e - g}$ 

(iv) Irredeemable bonds, paying annual after-tax interest, i[1 - t], in perpetuity, where  $P_0$  is the ex-interest value:

$$P_0 = \frac{i[1-t]}{k_{\text{dnet}}}$$
$$P_0 = \frac{i}{-1}$$

k<sub>d</sub>

or, without tax:

(v) Total value of the geared firm,  $V_q$  (based on MM):

$$V_g = V_u + TB_c$$

(vi) Future value of *S*, of a sum *X*, invested for *n* periods, compounded at *r*% interest:

$$S = X[1 + r]^r$$

(vii) Present value of 1.00 payable or receivable in *n* years, discounted at *r*% per annum:

$$PV = \frac{1}{\left[1 + r\right]^n}$$

(viii) Present value of an annuity of 1.00 per annum, receivable or payable for *n* years, commencing in one year, discounted at *r*% per annum:

$$PV = \frac{1}{r} \left[ 1 - \frac{1}{\left[1 + r\right]^n} \right]$$

(ix) Present value of 1.00 per annum, payable or receivable in perpetuity, commencing in one year, discounted at r% per annum:

$$PV = \frac{1}{r}$$

(x) Present value of 1.00 per annum, receivable or payable, commencing in one year, growing in perpetuity at a constant rate of g% per annum, discounted at r% per annum:

$$PV = \frac{1}{r-g}$$

FORMULAE CONTINUE ON THE NEXT PAGE

### Cost of capital

(i) Cost of irredeemable preference shares, paying an annual dividend, d, in perpetuity, and having a current ex-div price  $P_0$ :

$$k_{\text{pref}} = \frac{d}{P_0}$$

(ii) Cost of irredeemable bonds, paying annual net interest, i [1 - t], and having a current exinterest price  $P_0$ :

$$k_{d \text{ net}} = \frac{i[1-t]}{P_o}$$

(iii) Cost of ordinary (equity) shares, paying an annual dividend, d, in perpetuity, and having a current ex-div price  $P_0$ :

$$k_{\rm e} = \frac{d}{P_0}$$

(iv) Cost of ordinary (equity) shares, having a current ex-div price,  $P_0$ , having just paid a dividend,  $d_0$ , with the dividend growing in perpetuity by a constant g% per annum:

$$K_{\rm e} = \frac{d_1}{P_0} + g$$
 or  $K_{\rm e} = \frac{d_0[1+g]}{P_0} + g$ 

(v) Cost of ordinary (equity) shares, using the CAPM:

$$k_{\rm e} = R_f + [R_m - R_f]$$
ß

(vi) Cost of ordinary (equity) shares in a geared firm (no tax):

$$k_{eg} = k_0 + [k_o - k_d] \frac{V_D}{V_E}$$

(vii) Cost of ordinary (equity) share capital in a geared firm (with tax):

$$k_{eg} = k_{eu} + [k_{eu} - k_d] \frac{V_D [1 - t]}{V_E}$$

(viii) Weighted average cost of capital,  $k_0$ :

$$k_0 = k_{eg} \left[ \frac{V_E}{V_E + V_D} \right] + k_d \left[ \frac{V_D}{V_E + V_D} \right]$$

(ix) Adjusted cost of capital (MM formula):

$$K_{adj} = k_{eu} [1 - tL]$$
 Or  $r^* = r[1 - T^*L]$ 

In the following formulae,  $\beta_u$  is used for an ungeared  $\beta$  and  $\beta_g$  is used for a geared  $\beta$ :

(x)  $\beta_u$  from  $\beta_g$ , taking  $\beta_d$  as zero (no tax):

$$\beta_{u} = \beta_{g} \left[ \frac{V_{E}}{V_{E} + V_{D}} \right]$$

(xi) If  $\beta_d$  is not zero:

$$\beta_{u} = \beta_{g} \left[ \frac{V_{E}}{V_{E} + V_{D}} \right] + \beta_{d} \left[ \frac{V_{D}}{V_{D} + V_{E}} \right]$$

(xii)  $\beta_u$  from  $\beta_g$ , taking  $\beta_d$  as zero (with tax):

$$\beta_{u} = \beta_{g} \left[ \frac{V_{E}}{V_{E} + V_{D} \left[ 1 - t \right]} \right]$$

(xiii) Adjusted discount rate to use in international capital budgeting using interest rate parity:

1 + annual discount rate C\$	Exchange rate in 12 months' time C\$/euro
= 1 + annual discount rate euro	Spot rate C\$/euro

### Other formulae

(i) Interest rate parity (international Fisher effect):

Forward rate US\$/£ = Spot US\$/£ x  $\frac{1 + \text{nominal US interest rate}}{1 + \text{nominal UK interest rate}}$ 

(ii) Purchasing power parity (law of one price):

Forward rate US\$/£ = Spot US\$/£ x  $\frac{1 + US \text{ inflation rate}}{1 + UK \text{ inflation rate}}$ 

(iii) Link between nominal (money) and real interest rates:[1 + nominal (money) rate] = [1 + real interest rate][1 + inflation rate]

(iv) Equivalent annual cost:

Equivalent annual cost =  $\frac{PV \text{ of costs over } n \text{ years}}{n \text{ year annuity factor}}$ 

(v) Theoretical ex-rights price:

TERP = 
$$\frac{1}{N+1}$$
 [(N x cum rights price) + issue price]

(vi) Value of a right:

Value of a right = 
$$\frac{\text{Rights on price} - \text{issue price}}{N+1}$$

or

Theoretical ex rights price - issue price

Ν

where N = number of rights required to buy one share.

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### LIST OF VERBS USED IN THE QUESTION REQUIREMENTS

A list of the learning objectives and verbs that appear in the syllabus and in the question requirements for each question in this paper.

It is important that you answer the question according to the definition of the verb.

LEARNING OBJECTIVE	VERBS USED	DEFINITION
1 KNOWLEDGE		
What you are expected to know.	List	Make a list of
	State	Express, fully or clearly, the details of/facts of
	Define	Give the exact meaning of
2 COMPREHENSION		
What you are expected to understand.	Describe	Communicate the key features
	Distinguish	Highlight the differences between
	Explain	Make clear or intelligible/State the meaning of
	Identify	Recognise, establish or select after
	Illustrate	Lise an example to describe or explain
	mustrate	something
3 APPLICATION		
How you are expected to apply your knowledge.	Apply	To put to practical use
	Calculate/compute	To ascertain or reckon mathematically
	Demonstrate	To prove with certainty or to exhibit by
		practical means
	Prepare	To make or get ready for use
	Reconcile	To make or prove consistent/compatible
	Solve	Find an answer to
	Tabulate	Arrange in a table
4 ANALYSIS		
How you are expected to analyse the detail of	Analyse	Examine in detail the structure of
what you have learned.	Categorise	Place into a defined class or division
	Compare and contrast	Show the similarities and/or differences between
	Construct	To build up or compile
	Discuss	To examine in detail by argument
	Interpret	To translate into intelligible or familiar terms
	Produce	To create or bring into existence
5 EVALUATION		
How you are expected to use your learning to	Advise	To counsel, inform or notify
evaluate, make decisions or recommendations.	Evaluate	To appraise or assess the value of
	Recommend	To advise on a course of action

## Financial Management Pillar

## Strategic Level Paper

## P9 – Management Accounting – Financial Strategy

## November 2007

## Wednesday Morning Session