

EXAM PAPER 1

I. True(T) or False(F). Please fill in the bracket with T or F. (15%)

- In financial management, the more appropriate goal of the firm is maximization of shareholder wealth. ()
- The component cost of preferred stock must be adjusted for taxes which the stockholders must pay on the dividends. (
- If an investment project has a profitability index of 1.15, the project's internal rate of return exceeds its net present value. ()
- 4. With an annuity due the payments occur at the end of each period. ()
- If the firm decides to impose a capital constraint on investment projects, the appropriate decision criterion is to select the set of projects with the highest NPV subject to the capital constraint. ()
- 6. Business risk refers to the relative dispersion in the firm's EBIT. ()
- 7. Net working capital equals current assets less current liabilities. ()
- Under MM's model with corporate taxes, the benefits of debt financing stem solely from the tax deductibility of interest payments. ()
- 9. Investors can only expect to receive a return for incurring unsystematic risk. ()
- 10. The Security Market Line is a risk-return trade-off for combinations of the market portfolio and the riskless asset. ()

II. Multiple Choice (15%)

 Dorset Ltd wishes to calculate its weighted average cost of capital for use in investment appraisal. The company is financed by 150 million \$1 ordinary shares, which have a current market value of \$2, and \$100 million 12 per cent irredeemable debentures, which are currently quoted at \$150 per \$100 nominal value. The cost of ordinary share capital is 11 per cent and the rate of corporation tax is 25 per cent.

What is the weighted average cost of capital for Dorset Ltd? (To one decimal place)

A. 9.0 per cent

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- B. 9.3 per cent
- C. 10.4 per cent
- D. 11.4 per cent
- 2. Cheshire Ltd has developed a revolutionary form of tyre gauge at a cost of \$300,000 to date. To produce the tyre gauge, a new machine will be acquired immediately at a cost of \$750,000. The machine will be sold at the end of the five years for \$350,000 and will be depreciated over its life using the straight-line method.

The tyre gauge has an expected life of five years and estimated future profits from the product are: *Years*

1 2 3 4 5 \$000 \$000 \$000 \$000

Estimated profit 80 160 240 140 130

What is the payback period for the new tyre gauge? (To the nearest month)

- A. 3 years 2 months
- B. 4 years 2 months
- C. 4 years 3 months
- D. 4 years 11 months
- 3. Cumbria Ltd has \$1 ordinary shares in issue that have a current market value of \$3. The dividend expected for next year is \$0.40 and future dividends are expected to grow at the rate of 5 per cent per annum. The rate of corporation tax is 20 per cent and the dividend Growth model is used to calculate the cost of ordinary shares.

What is the cost of ordinary shares to the business?

- **A.** 6.1%
- **B.** 15.7%
- **C.** 18.3%
- **D.** 19.0%
- 4. Calcite Ltd used the NPV and IRR methods of investment appraisal to evaluate a project that has an initial cash outlay followed by annual net cash inflows over its life. After the evaluation

had been undertaken, it was discovered that the cost of capital had been incorrectly calculated and that the correct cost of capital figure was in fact higher than that used.

What will be the effect on the NPV and IRR figures of correcting for this error?

Effect on

NPV IRR

- A. Decrease Decrease
- B. Decrease No change
- C. Increase Increase
- **D.** Increase No Change
- 5. A business evaluates an investment project that has an initial outlay followed by annual net cash inflows of \$10 million throughout its infinite life. The evaluation of the inflows produced a present value of \$50 million and a profitability (present value) index of 2.0.

What is the internal rate of return and initial outlay of this project?

- IRR Initial outlay
- % \$m
 - **A.** 20 25
 - **B.** 20 100
 - **C.** 40 25
 - **D.** 10 100
- 6. Quartz Ltd pays an annual dividend of 30 cent per share to shareholders, which is expected to continue in perpetuity. The average rate of return for the market is 9% and the company has a beta coefficient of 1.5. The risk-free rate of return is 4%.

What is the expected rate of return for the shareholders of the company and the predicted value of the shares in the company?

Expecte	d rate	Predic	ted
of return	I	value	
(%)		(cent)	
Α.	23.5		705
В.	17.5		171

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- C. 16.5 182
 D. 11.5 261
- Tourmaline Ltd pays its major credit supplier 40 days after receiving the goods and receives no settlement discount. The supplier has recently offered the company revised credit terms of 3/10, net 40.

If Tourmaline Ltd refuses the settlement discount and pays in full after 40 days, what is the approximate, implied, interest cost that is incurred by the company per year?

- **A.** 10.3%
- **B.** 27.4%
- **C.** 28.2%
- **D.** 37.6%
- **8.** Carrickfergus Ltd wishes to forecast its financial performance and position for the forthcoming year. The forecast model used by the company incorporates the following relationships:

Sales: total assets employed 2.5:1

Current assets: current liabilities 1.8:1

Quick assets: current liabilities 1.2:1

Fixed assets: current assets 1.0:1

If sales for the forthcoming year are expected to be \$800,000, what is the forecast closing stock figure?

- **A.** \$53,333
- **B.** \$71,111
- **C.** \$85,926
- **D.** \$96,000.
- **9.** The Modigliani and Miller (no taxes) proposition concerning capital gearing states that, as the level of capital gearing increases from zero,
 - A. the cost of equity capital will remain unchanged
 - **B.** the weighted average cost of capital will decrease
 - **C.** the value of the business will remain unchanged

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D. the cost of loan capital will increase.

10. A study of the shares of companies listed on a particular stock market found that:

(i) share prices were independent of past share price movements and followed a random path.

(ii) some investors used the published accounts of the companies to analyse performance and, by

doing so, made abnormal gains over many years.

Which of the following would be consistent with these findings?

- A. The stock market is inefficient
- **B.** The stock market is efficient in the weak form
- C. The stock market is efficient in the semi-strong form
- **D.** The stock market is efficient in the strong form
- **11.** The economic order quantity (EOQ) for stocks can be calculated by using an equation of the form: $EOQ = \sqrt{(2XY/Z)}$

What is Z in the above equation?

- A. Cost of placing an order
- **B.** Annual demand for the item of stock
- C. Cost of holding one unit of stock for one year
- D. The lead time between placing an order and receiving the goods

12. Which of the following is associated with the problem of "overtrading"?

- A. Higher-than-normal earnings per share
- **B.** Higher-than-normal sales to capital employed ratio
- **C.** Lower-than-normal gearing ratio
- **D.** Lower-than-normal stock turnover ratio
- 13. Investors have an expected rate of return of 8% from ordinary shares in Algol Ltd, which have a beta of 1.2. The expected returns to the market are 7%.

What will be the expected rate of return from ordinary shares in Rigel Ltd, which have a beta

- of 1.8?
 - **A.** 9.0%

- **B.** 10.5%
- **C.** 11.0%
- **D.** 12.6%.
- 14. Chrysotile Ltd has ordinary shares with a par value of \$0.50 in issue. The company generated earnings per share of 45c for the financial year that has just ended. The dividend cover ratio is 2.5 times and the gross dividend yield is 2% (Ignore taxation).

What is the price/earnings ratio of the company?

- **A.** 2.8 times
- **B.** 5.0 times
- **C.** 20.0 times
- **D.** 40.0 times

15. Ethical behavior is important because it:

- A. builds customer loyalty
- **B.** builds a good reputation
- C. avoids fines and legal expenses
- **D.** all of the above

III. Solving the following problems. (60 marks)

1. Brambling (Electronics) Ltd is a research-led business that specialises in the development of surveillance equipment. The company has recently developed a new form of camera with a powerful fibre-optic lens and is currently considering whether or not to produce the camera. The Board of Directors will soon meet to make a final decision and has the following information available to help it decide:

- (i) The cost of developing the camera has been \$1,400,000 to date and the company is committed to spending a further \$350,000 within the next two months.
- (ii) The company has spare production capacity and can produce the camera using machinery that will cost \$4,700,000 and which will be purchased immediately. It is expected to be sold at the end of four years for \$800,000.

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- (iii) Total fixed costs identified with the production of the camera are \$1,725,000 per year. This includes a depreciation charge in respect of the machinery of \$975,000 per year and a charge allocated to represent a fair share of the fixed costs of the business as a whole of \$250,000 per year.
- (iv) The cameras are expected to sell for \$10,000 each and the marketing department believes that the business can sell 800 cameras per year over the next four years.
- (v) The variable costs of production are \$7,000 per camera.
- (vi) If the business decides not to produce the camera it can sell the patents immediately for \$1,300,000.

The company has a cost of capital of 12%.

Ignore taxation.

Required:

- (a) Calculate the net present value of producing and selling the new camera versus the alternative of selling the patent. (6 marks)
- (b) Carry out a separate sensitivity analysis to show by how much the following factors would have to change before the proposal to produce and sell the new camera has an NPV of zero:
 - (i) the initial outlay on the machinery;
 - (ii) the discount rate;
 - (iii) the residual value of the machinery;
 - (iv) the annual net operating cash flows. (11 marks)

(c) Briefly evaluate your findings in (a) and (b) above. (3 marks)

(20 marks)

2. Grebe Ltd operates a chain of cellular telephone stores in the UK. An abbreviated profit and loss

account and balance sheet of the business for the year that has just ended is as follows:

Abbreviated profit and loss account for the year ended 31 May 2003

	\$000
Sales	<u>6,450</u>
Operating profit for the year	800
Debenture interest payable	<u>160</u>

Net profit before taxation	640
Corporation tax (20%)	<u>128</u>
Net profit after taxation	512
Dividends proposed	256
Retained profit for the year	256

Abbreviated balance sheet as at 31 May 2003

	\$000	\$000
Fixed assets at written down values		3,500
Current assets	1,800	
Less Creditors: amounts falling due within one year	<u>1,100</u>	700
		4,200
Less Creditors: amounts falling due after more than one year		<u>2,000</u>
		2,200
Capital and reserves		
\$0.50 Ordinary shares		600
Retained profit		<u>1,600</u>
		2,200

The company is expecting a surge in sales following advances in cellular telephone technology that should translate into additional operating profits of \$180,000 per year for the foreseeable future. However, the company will need to invest \$1,200,000 immediately in expanding the asset base of the business if it is to achieve these additional profits.

The business has approached a large supplier that already has an equity investment in the business to see whether it would be prepared to provide further funds for the business. The supplier has indicated it would be willing to provide the necessary funds by either:

(i) an issue of \$0.50 ordinary shares at a premium of \$1.50 per share, or

(ii) an issue of \$1,200,000 10% debentures at par.

The Board of Directors of Grebe Ltd has already announced that it will maintain the same dividend payout ratio in future years as in the past and that this policy will be unaffected by the form of finance raised.

Required:

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- (a) For each of the financing options, calculate the forecast earnings per share for the forthcoming year;(10 marks)
- (b) Calculate the level of operating profit at which the earnings per share will be the same under each financing option. (10 marks)

(20 marks)

- 3. Bartok Ltd produces a single product. Financial data concerning the product is as follows:
- \$ \$
 Selling price per unit
 Variable cost per unit
 17
 Fixed costs per unit
 2

Net profit <u>1</u>

At present, total credit sales for the product are \$1.2m and the average collection period is one month. In order to stimulate sales for the product, the company is considering liberalising its credit policy so as to allow an average collection period of 1 1/2 months. This change of policy will allow the company to break into the US market where, currently, it has no presence. As a result of this breakthrough, sales will increase by 25%. However, there would be an additional investment required in stocks of \$150,000 and an increase in trade creditors of \$50,000.

The company requires a 25% rate of return on its investments.

20

<u>19</u>

Ignore taxation.

Required:

- (a) Evaluate the proposal to increase the average collection period for debtors assuming:
 - (i) all customers take advantage of the longer credit period (8 marks)
 - (ii) only new customers take advantage of the longer credit period. (8 marks)
- (b) Identify and discuss the main factors which influence the credit terms granted to customers by a company. (4 marks)

(20 marks)

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ANSWERS FOR EXAM PAPER 1

I. (10%, 1 mark each)

1. T 2. F 3. F 4. F 5. T 6. T 7. T 8. T 9. F 10. F

II. (30%, two marks each)

1. B	2. A	3. C	4. B	5. C
6. D	7. D	8. A	9. C	10. B
11. C	12. B	13. C	14. C	15. D

III. (60%, 20marks each)

1. (a) Annual operating cash flows can be calculated as follows:

	\$m	\$m
Sales (800 x \$10,000)		8.0
Less		
Variable costs (800 x \$7,000)	5.6	
Fixed costs	<u>0·5</u>	<u>6·1</u>
		1.9

(2 marks)

Cash flows relating to the project are as follows:

	Year0	1	2	3	4
	\$m	\$m	\$m	\$m	\$m
Machinery	(4.7)				0.8
Opportunity cost	(1.3)				
Annual cash flows		<u>1·9</u>	<u>1·9</u>	<u>1-9</u>	<u>1·9</u>
	(6.0)	1.9	1.9	1.9	2.7

(2 marks)

The net present value of the project is:



	\$m	\$m	\$m	\$m	\$m
Cash flows	(6-0)	1.9	1.9	1.9	2.7
Discount rate (12%)	1.0	0.89	0.80	0.71	0.64
Present value	(6-0)	1.69	1.52	1.35	1.73
NPV	<u>0-29</u>				

(2maks)

(b) (i) The increase required in the initial outlay on machinery before the project becomes no longer profitable will be \$0.29m. The machinery is already expressed in present value terms and so this figure is the same as the net present value of the project. This figure is 6.2% higher than the initial cost figure stated. (2 marks)

	\$m	\$m	\$m	\$m	\$m
Cash flows	(6.0)	1.9	1.9	1.9	2.7
Discount rate (14%)	1.0	0.88	0.77	0.68	0.59
Present value	(6.0)	1.67	1.46	1.29	1.59
NPV	<u>0·01</u>				

(ii) If the discount rate is increased to 14%, the NPV of the project is:

Thus, the project will become unprofitable at approximately 14% cost of capital. This represents a 16-7% increase in the cost of capital. **(3 marks)**

- (iii) The decrease in the residual value of the equipment (R) that will make the project no longer profitable is calculated as follows:
 - (R x discount factor at the end of four years) NPV of the project = 0
 - This can be rearranged as follows:
 - (R x discount factor at the end of four years) = NPV of the project

R x 0.64 = \$0.29 m

R = 0.29m/0.64 = 0.45m

This represents a 43.8% decrease in the estimated residual value. (3marks)

(iv) The decrease in annual net operating cash flows (C) to make the project no longer profitable is calculated as follows:

(C x annuity factor for a four-year period) – NPV = 0

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This can be rearranged as follows:

(C x annuity factor for a four-year period) = NPV

C x 3·04 = \$0·29m

C = 0.29m/3.04

C = \$0.095m

This represents a decrease of 5.0% on the estimated annual net operating cash flows.

- (3marks)
- (c) The net present value calculations in (a) above indicate that the project will increase shareholder wealth if it is accepted. The sensitivity calculations in (b) above show by how much each of the key variables will have to change before the project becomes no longer profitable. It can be seen that the most sensitive factor is the annual net operating cash flows followed by the initial cost of the machinery, the discount rate and finally the residual value of the machinery. The annual net operating cash flows will require only a five per cent decrease before the project ceases to be profitable. (3marks)

	Shares	Debentures
	\$000	\$000
Profit before interest and taxation	980	980
Debenture interest payable	<u>160</u>	<u>280</u>
Profit before taxation	820	700
Corporation tax (20%)	<u>164</u>	<u>140</u>
Profit after taxation	656	560
Dividend	<u>328</u>	<u>280</u>
Retained profit for the year	<u>328</u>	<u>280</u>
Forecast earnings per share	\$656,000/1,800,000	\$560,000/1,200,000
	=36·4c (5marks)	46·7c (5marks)

2 (a) Forecast profit and loss account for the year ended 31 May 2004

- (b) The level of operating profit, or profit before interest and taxation (PBIT), at which earnings per share under each method are equal (PBIT = x) is calculated as follows:
 - Shares

Debentures

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(x – B/E PBIT)(1 – ta	x rate) (x – B/E PBIT)(1 – tax rate)	
No. of shares	No. of sh	ares	
The level of PBIT at v	which earnings per share are	equal is:	
(x - \$0.16m)(1 - 0.20)) (x − \$0·28m)(1 − 0·20)		
	=	—— (3 marks)	
1.8m	1.2m		
(0·8 x – \$0·128m)	(0·8 x – \$0·224m)		
	=		
1.8m	1.2m		
0·96m x – \$0·1536m	= 1·44m x – \$0·4032m		
0∙48m x = \$0∙2496m			
x = \$0·52m (2 ma	·ks)		

3. (a) (i) The contribution per unit is \$3 (i.e. \$20 - \$17). A 25% increase in sales will lead to an increase of sales revenue of \$0.3m or 15,000 units (i.e. \$0.3m/\$20). Hence the increase in contribution and profit will be:

15,000 x \$3 = \$45,000 (4marks)

The additional investment required will be:

	\$
Increase in stocks	150,000
Increase in debtors [(\$1.5m/12) x 11/2m] - [(1.2m/12) x 1m)]	87,500
	237,500
Increase in creditors	50,000
Net increase in working capital	187,500
Return on investment	= <u>45,000</u> x 100%
	187,500
	= 24.0 %

(6 marks)

(ii) The additional investment required will be:

\$



Increase in stocks	150,000
Increase in debtors [(\$0.3m/12) x 11/2]	37,500
	187,500
Increase in creditors	50,000
Net increase in working capital	137,500
Return on investment	= <u>45,000</u> x 100%
	137,500
	= 32.7 %

(6 marks)

Thus, it is if new customers only take advantage of the longer credit period that the proposed change in policy will meet the profit requirements of the company.

(b) The main factors that influence the credit terms granted to customers are: *Management policies* /*Market strength*/Order size and frequency/Profitability/Resources of the business/Resources of the customer/Industry norms, etc.

(4 marks)