

FINAL ASSESSMENT SCRIPT SUBMISSION FORM

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ACCA – Paper F9 Financial Management September and December 2015 Final assessment

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Notice to Markers

- 1 When commenting about the script performance, please ensure on individual questions and on overall assessment your comments cover areas of examination technique including:

<ul style="list-style-type: none">• Time management	<ul style="list-style-type: none">• Handwriting	<ul style="list-style-type: none">• Presentation and layout	<ul style="list-style-type: none">• Use of English
<ul style="list-style-type: none">• Points clearly and concisely made	<ul style="list-style-type: none">• Relevance of answers to question	<ul style="list-style-type: none">• Coverage and depth of answer	<ul style="list-style-type: none">• Accuracy of calculations
<ul style="list-style-type: none">• Calculations cross-referenced to workings	<ul style="list-style-type: none">• All parts of the requirement attempted	<ul style="list-style-type: none">• Length of answers equates to marks available	<ul style="list-style-type: none">• Read the question carefully

- 2 For each question, please provide suitable constructive comments

Question Number	General Comments	Exam Technique Comments

ACCA FINAL ASSESSMENT

Financial Management

September and December 2015

Time allowed

Reading and planning: 15 minutes

Writing: 3 hours

This paper is divided into two sections:

SECTION A – ALL TWENTY questions are compulsory and MUST be attempted

SECTION B – ALL FIVE questions are compulsory and MUST be attempted

Formulae Sheet, Present Value and Annuity Tables are on pages 14, 15 and 16

Do NOT open this paper until instructed by the supervisor.

During reading and planning time only the question paper may be annotated. You must NOT write in your answer booklet until instructed by the supervisor.

This question paper must not be removed from the examination hall.

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Paper F9

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SECTION A – ALL TWENTY questions are compulsory and MUST be attempted

Please use the space provided on the inside cover of the Candidate Answer Booklet to indicate your chosen answer to each multiple choice question.

Each question is worth two marks.

1 Which of the following events is most likely to lead to a decrease in a firm's operating risk?

- A An increase in the proportion of the firm's operating costs which are variable
- B An increase in the proportion of the firm's operating capital which is equity
- C An increase in the proportion of the firm's operating costs which are fixed
- D An increase in the proportion of the firm's operating capital which is debt

2 A company purchased a machine four years ago at a cost of \$25,000. It is to be depreciated on a straight line basis over five years.

It is no longer used on normal production work and has a scrap value of \$2,000.

A one-off contract is being considered which would make use of this machine for six months. The contract would require adjustments to be made to the machine costing \$800. At the end of the contract it is estimated that the scrap value would be \$1,500.

What is the relevant cost of the machine to the contract?

- A \$1,300
- B \$3,300
- C \$4,300
- D \$23,500

3 An education authority is considering the implementation of a CCTV (closed circuit television) security system in one of its schools. Details of the proposed project are as follows:

Life of project	5 years
Initial cost	\$75,000
Annual savings:	
Labour costs	\$20,000
Other costs	\$5,000
NPV at 15%	\$8,800

Calculate the internal rate of return for this project to the nearest 1%

- A 16%
- B 18%
- C 20%
- D 22%

4 According to the traditional view of capital structure, which of the following statements is correct?

- A As the level of gearing increases, the cost of debt remains unchanged.
- B The cost of equity falls as the level of gearing increases and financial risk increases.
- C The weighted average cost of capital does not remain constant, but rather falls initially as the proportion of debt capital increases, and then begins to increase as the rising cost of equity (and possibly debt) becomes more significant.
- D The optimal level of gearing is where the company's weighted average cost of capital is maximised.

5 In the year to 31 December 2014, a publishing company declares an interim ordinary dividend of 9.6c per share and a final ordinary dividend of 10.8c per share.

Assuming an ex div share price of 356c, what is the dividend yield?

- A 2.70%
- B 5.73%
- C 5.60%
- D 3.03%

6 According to the expectations theory, investors' expectations of decreasing inflation will result in which of the following?

- A A downward-sloping yield curve
- B An upward-sloping yield curve
- C A flat yield curve
- D A humped yield curve

7 For a retailer, let

- S = Sales
- P = Purchases
- OP = Opening payables
- CP = Closing payables

Which one of the following is the best expression for payables days at the period end?

- A $[OP + CP]/P \times 365$
- B $[OP + CP]/S \times 365$
- C $CP/P \times 365$
- D $OP/P \times 365$

- 8 Trotter Co has in issue 7% loan notes which are redeemable at their nominal value of \$100 in four years' time. Alternatively, each loan may be converted on that date into 35 ordinary shares of the company.

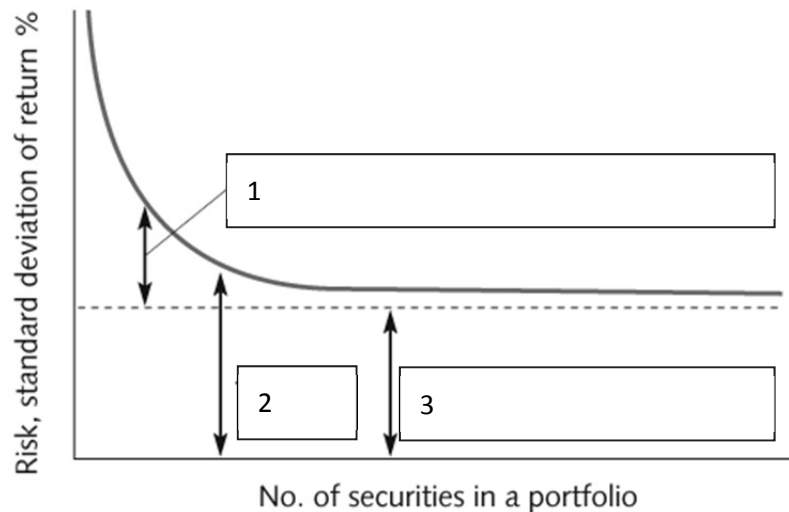
The current ordinary share price of Trotter Co is \$3.25 and this is expected to grow at 3% per year for the foreseeable future.

Trotter Co has a pre-tax cost of debt of 6% per year.

What is the current market value of each \$100 convertible loan note?

- A \$102.12
- B \$110.49
- C \$125.71
- D \$138.62

- 9 Which ONE of the following CORRECTLY labels the lines on the following graph?



- A 1 = Total risk, 2 = Unsystematic risk, 3 = Systematic risk
 - B 1 = Unsystematic risk, 2 = Systematic risk, 3 = Total risk
 - C 1 = Unsystematic risk, 2 = Total risk, 3 = Systematic risk
 - D 1 = Total risk, 2 = Systematic risk, 3 = Unsystematic risk
- 10 Which of the following conditions are necessary for a company to use the pre-project company weighted average cost of capital (WACC) as a discount rate for project appraisal?
- A The capital structure will change, as a result of the project
 - B The project carries a different level of business risk from the company's existing operations
 - C The new investment is large, in comparison to the capital of the company
 - D The company will raise additional finance to maintain its current gearing ratio

11 A company has been trading for 10 months and achieved the following monthly profits:

- (£5,000) twice
- £1,000 three times
- £7,000 four times
- £12,000 once

Using an Expected Value calculation, which ONE of the following is the average monthly profit?

- A £12,000
- B £7,000
- C £1,000
- D £3,300

12 Paragon plc's operating profit before interest and tax is \$100,000, interest expense is \$25,000 and profit before tax is \$75,000.

What is Paragon's interest cover ratio?

- A 4 times
- B 1 times
- C 3 times
- D 7 times

13 A cash budget was drawn up as follows:

	<i>October</i>	<i>November</i>	<i>December</i>
	\$	\$	\$
Receipts			
Credit sales	25,000	11,500	16,500
Cash sales	11,000	5,500	6,600
Payments			
Suppliers	12,000	4,250	8,100
Wages	5,700	2,320	3,200
Overheads	3,250	2,750	1,000
Opening cash	700		

The closing cash balance for December is budgeted to be:

- A \$20,550 overdraft
- B \$21,050 overdraft
- C \$33,530 deposit
- D \$34,230 deposit

- 14** The following options are held by Frances plc at their expiry date:
- (1) A call option on GBP 500,000 in exchange for USD at an exercise price of GBP 1 = USD 1.90. The exchange rate at the expiry date is GBP 1 = USD 1.95.
 - (2) A put option on GBP 400,000 in exchange for Singapore Dollars at an exercise price of GBP 1 = SGD 2.90. The exchange rate at the expiry date is GBP 1 = SGD 2.95.

Which one of the following combinations (exercise/lapse) should be undertaken by the company?

- | | <i>Call</i> | <i>Put</i> |
|---|-------------|------------|
| A | Exercise | Lapse |
| B | Exercise | Exercise |
| C | Lapse | Exercise |
| D | Lapse | Lapse |
- 15** The current spot exchange rate between sterling and the Euro is EUR 1.4415/GBP. The sterling three month interest rate is 5.75% pa and the Euro three month interest rate is 4.75% p.a.
- What should the three month EUR/GBP forward rate be?**
- A 1.4553
 - B 1.4379
 - C 1.4279
 - D 1.4451

16 An interest rate option is:

- A A right but not an obligation to buy or sell interest rate futures
- B An obligation to obtain a loan at an agreed interest rate at a future date
- C A right but not an obligation to obtain a loan at a future date
- D A right but not an obligation to an agreed interest rate on a notional loan

17 Which of the following is the equivalent of lease finance within the Islamic banking model?

- A Murabaha
- B Sukuk
- C Ijara
- D Mudaraba

18 Which of the following statements are correct?

- 1 Financial accounting is concerned with providing information about the historical results of past plans and decisions.
 - 2 Management accounting is concerned with providing information for the more day-to-day functions of control and decision making.
 - 3 Financial management is concerned with the long-term raising of finance and the allocation and control of resources.
- A 1 and 2 only
 - B 1 and 3 only
 - C 2 and 3 only
 - D 1, 2 and 3

19 Comment on the validity of the following statements.

- 1 Financial intermediation refers to the process whereby potential borrowers are brought together with potential lenders by a third party.
 - 2 There are two main types of financial markets: the primary market deals in new securities and the secondary market deals in second-hand' securities.
- A Statement 1: True Statement 2: False
 - B Statement 1: True Statement 2: True
 - C Statement 1: False Statement 2: False
 - D Statement 1: False Statement 2: True

20 Under the terms of the UK Corporate Governance Code, what percentage of the board, excluding the chairman, should be independent non-executive directors?

- A at least 25%
- B at least 50%
- C at least 75%
- D 100%

SECTION B – ALL FIVE questions are compulsory and MUST be attempted

- 1 The directors of XQ Co formally disclosed their overriding objective at a recent annual general meeting when the chairman announced:

'We aim for growth in our equity value in the stock markets.'

This announcement displeased the employee representatives on the Works Council. They have argued that the company's management should favour growth both of profits and of turnover, so providing additional employment opportunities.

The company disclosed the following five-year summary of results in its recently published annual report:

	20X1	20X2	20X3	20X4	20X5
	\$000	\$000	\$000	\$000	\$000
Turnover	156,826	164,220	167,844	176,408	180,913
Profit after taxation	27,251	30,458	28,650	30,612	32,193
Dividend/share	50 cents	60 cents	70 cents	70 cents	80 cents
PE ratio*	5.7	5.3	6.0	5.5	6.5
Number of employees at year end	1,960	1,723	1,587	1,432	1,157

* based on market prices immediately after the preliminary announcement of annual results.

There were 30 million shares in issue throughout the above five-year period.

Required

- (a) **Assess whether the directors have, thus far, met their stated objective. (5 marks)**
- (b) **Analyse the apparently conflicting views held by the directors and by the employee representatives and consider how they could be reconciled. (5 marks)**

(Total: 10 marks)

- 2 You are an analyst working for an investment institution contemplating an investment of up to 1 million shares in Bon Chic Co.

Bon Chic manages a chain of retail shops, within the UK, which specialise in selling stylish clothing and accessories to a target market of younger, more affluent shoppers. The merchandise is all designed by a team of designers employed by the company and marketed under the Bon Chic label exclusively through its own shops. Design is one of the company's key features. Recently the company augmented its sales by starting an Internet-based mail order operation. Plans exist to expand sales operations in the medium-term by opening a few branches in France and Germany. Manufacturing is undertaken by a small group of businesses with which Bon Chic has close relationships.

It is now January 2015. The company was founded 20 years ago by two designers (now in their forties) with a flair for the business. Since then the company has expanded dramatically on the back of massive market acceptance and shrewd management. Equity finance, which originally came from the founders and their families, was subsequently provided by venture capitalists and from reinvested profits.

Currently the company's equity of 10 million 10c shares is owned 24% by a venture capital fund and the rest by the two founders, their families and some of the company's senior employees. The venture capital fund now wishes to liquidate its investment and the company is considering raising additional equity finance to support the European expansion plans.

To enable this, and since the other major shareholders do not have sufficient personal funds to buy out the venture capitalists, the directors are considering a listing on the Alternative Investment Market of the London Stock Exchange.

Audited financial information of Bon Chic is as follows.

Summarised income statements for the years ended 31 December:

	2014	2013	2012	2011	2010
	\$m	\$m	\$m	\$m	\$m
Revenue	67.5	58.7	44.6	33.9	26.9
Profit from operations	4.9	4.2	3.0	2.4	1.7
Finance expense	1.0	0.6	0.3	0.3	0.2
Profit before taxation	3.9	3.6	2.7	2.1	1.5
Profit after tax for the period	2.8	2.6	1.9	1.5	1.1

Summarised statements of financial position as at 31 December:

	2014	2013	2012	2011	2010
	\$m	\$m	\$m	\$m	\$m
ASSETS					
Non-current assets	11.3	9.9	7.4	6.0	3.5
Current assets	22.4	16.9	12.2	9.4	7.1
Total assets	33.7	26.8	19.6	15.4	10.6
EQUITY AND LIABILITIES					
Equity					
Ordinary share capital	1.0	1.0	1.0	1.0	1.0
Retained earnings	10.3	8.0	5.7	4.0	2.5
	11.3	9.0	6.7	5.0	3.5
Non-current liabilities	3.6	1.6	1.7	2.3	0.5
Current liabilities	18.8	16.2	11.2	8.1	6.6
Total equity and liabilities	33.7	26.8	19.6	15.4	10.6

Summary of dividends paid in the years ended 31 December:

	2014	2013	2012	2011	2010
	\$m	\$m	\$m	\$m	\$m
Profit after tax for the period	2.8	2.6	1.9	1.5	1.1
Dividends	0.5	0.3	0.2	0.0	0.0
Increase in retained earnings	2.3	2.3	1.7	1.5	1.1

The company has made a forecast that sales for the year ending 31 December 2015 will be 20% greater than for 2014. The company expects to pay a dividend of 6.6c per share in 2015, increasing at 8% per year from 2016 onwards. The directors view the future with great confidence.

Broadly, the directors believe that that assets appearing in the statements of financial position are stated at fair value, except for property which as at 31 December 2014 has a carrying value of \$8.6m and has been valued professionally at \$10.2m.

The following information is available about the ‘Retailers, general’ sector of the Financial Times Stock Exchange All-Share Index of listed companies:

P/E	15.2
Dividend yield	3.07%
Dividend cover	2.12

Required:

- (a) (i) Using the above market average dividend yield, P/E ratio and the company’s reported net assets, estimate three alternative values per share for Bon Chic.
- (ii) Using the cost of equity of 12% per year, estimate a dividend-based value based on future predicted dividends and explain, with calculations, how future predicted growth in dividends affects a dividend-based valuation. (6 marks)
- (b) Critically comment the following statement, clearly explaining any technical terms contained within it or used by you.

‘In a semi-strong form efficient capital market the price/earnings ratio of all companies will be equal’ (4 marks)

(Total: 10 marks)

- 3 Halo Co is a UK company which frequently trades in high-tech goods with USA-based companies. Historically the company hasn’t hedged its currency transactions, but because of recent financial market volatility, currency hedging is now being considered.

The following imports and exports are due in six months’ time, designated in the currencies shows:

	<i>Halo exports to</i>	<i>Halo imports from</i>
Company A	£150,000	\$1,000,000
Company B	Nil	\$700,000
Company C	\$500,000	£400,000

Assume that it is now 30 September and that futures contracts mature at the relevant

Exchange rates	\$/£
Spot	1.9966 – 2.0020
3 months forward	1.9876 – 1.9930
6 months forward	1.9711 – 1.9755

Annual borrowing and investing interest rates available to Halo

Sterling up to 6 months	6.5% – 5.2%
Dollar up to 6 months	5.0% – 3.0%

Required:

- (a) Show how the six month currency risk could be managed using:
- (i) Forward market hedging (3 marks)
 - (ii) Money market hedging (4 marks)
- (b) Explain the following methods of attempting to deal with transaction risk:
- (i) Matching
 - (ii) Foreign currency bank accounts
 - (iii) Leading and lagging (3 marks)
- (Total: 10 marks)**

- 4** Patsy Co is an online retailer of books, CDs and DVDs. The company was set up five years ago by a wealthy entrepreneur, David Rose, and has now grown to the point where the Board of Directors has decided that a listing should be sought on the local stock exchange. David Rose owns 80 per cent of the ordinary shares and has agreed to sell all of these as part of the public offering.

Recently the Board of Directors began to debate the future of the dividend policy of the company, assuming that the stock exchange listing would be successful. However, there was a clear divergence of views. The Chairman felt that the current dividend policy was unacceptable and needed to be changed. He argued that the company had been investing heavily in its distribution methods and in advertising in the early years and that the dividend policy had not been a pressing issue. However, the proposed listing must now lead to reconsideration of the importance of dividends. The Chief Operating Officer, on the other hand, felt that the Chairman's concerns were unfounded as the pattern had no effect on shareholder wealth.

Information concerning the company since it was first set up is as follows:

<i>Year ended 30 June</i>	<i>Net profits after taxation</i>	<i>Ordinary dividends</i>	<i>Ordinary shares in issue</i>
	\$000	\$000	\$000
2009	650	320	800
2010	520	150	1,000
2011	760	480	1,000
2012	1,240	600	1,500
2013	1,450	540	1,500

Required:

- (a) Analyse the dividend policy that has been pursued to date and discuss whether a change would be in the interests of shareholders. (9 marks)
- (B) Discuss the key points that should be taken into account when establishing an appropriate dividend policy for the company. (6 marks)
- (Total: 15 marks)**

5 Weather Co has recently taken over many smaller companies, which it now runs as separate divisions. One division, Thunder, has just developed a new product called Lightning and is now considering whether to put it into production. The following information is available:

- (i) Costs incurred in the development of Lightning amount to \$480,000.
- (ii) Production of Lightning will require the purchase of new machinery at a cost of \$2,400,000, payable on the first day of the new financial year. This machinery is specific to the production of Lightning and will be obsolete and valueless when production ceases. The machinery has a production life of four years and a production capacity of 30,000 units per annum.
- (iii) Production costs of Lightning (at year 1 prices) are estimated as follows:

	\$
Direct material	8
Direct labour	12
Variable overheads	12

In addition, incremental fixed production costs (at year 1 prices), including straight-line depreciation on plant and machinery, will amount to \$800,000 per annum.

- (iv) The selling price of Lightning will be \$80 per unit (at year 1 prices). Demand is expected to be 25,000 units per annum for the next four years.
- (v) The consumer price index is expected to be at 5% per annum for the next four years and the selling price of Lightning is expected to increase at the same rate. Annual inflation rates for production costs are expected to be as follows:

	%
Direct materials	4
Direct labour	10
Variable overheads	4
Fixed costs	5

- (vi) The company's cost of capital in money terms is expected to be 15%.
- (vii) Corporation tax is 30% and is payable one year in arrears. Tax-allowable depreciation of 25 per cent on a reducing balance is available on capital expenditure.
- (viii) This investment will also require an investment in working capital of \$500,000 payable at the start of the project. This is not expected to change during the life of the investment.

Unless otherwise specified, all costs and revenues should be assumed to arise at the end of each year.

The financial manager has recommended that a discounted cash flow method of project appraisal be used, but some members of the board are reluctant to do this.

Required:

- (a) Calculate the net present value for the proposed investment and comment on your result. (12 marks)
- (b) One of the directors has suggested using payback to assess the investments. Explain to him the advantages and disadvantages of using payback as a method of investment appraisal. (3 marks)

(Total: 15 marks)

FORMULAE SHEET**Economic order quantity**

$$= \sqrt{\frac{2C_oD}{C_H}}$$

Miller-Orr Model

$$\text{Return point} = \text{Lower limit} + \left(\frac{1}{3} \times \text{spread}\right)$$

$$\text{Spread} = 3 \left[\frac{\frac{3}{4} \times \text{Transaction cost} \times \text{Variance of cashflow}}{\text{Interest rate}} \right]^{\frac{1}{4}}$$

The Capital Asset Pricing Model

$$E(r)_j = R_f + \beta_j (E(r_m) - R_f)$$

The asset beta formula

$$\beta_a = \left(\frac{V_e}{(V_e + V_d(1-T))} \beta_e \right) + \left(\frac{V_d(1-T)}{(V_e + V_d(1-T))} \beta_d \right)$$

The Growth Model

$$P_o = \frac{D_o(1+g)}{(r_e - g)}$$

Gordon's growth approximation

$$g = br_e$$

The weighted average cost of capital

$$\text{WACC} = \left(\frac{V_e}{V_e + V_d} \right) k_e + \left(\frac{V_d}{V_e + V_d} \right) k_d(1-T)$$

The Fisher formula

$$(1+i) = (1+r)(1+h)$$

Purchasing power parity and interest rate parity

$$S_1 = S_0 \times \frac{(1+h_c)}{(1+h_b)} \quad F_o = S_0 \times \frac{(1+i_c)}{(1+i_b)}$$

PRESENT VALUE TABLE

Present value of 1 i.e. $(1 + r)^{-n}$

Where r = discount rate

n = number of periods until payment

<i>Periods</i> (n)	<i>Discount rates (r)</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	1
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	2
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	3
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	4
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	5
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	6
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	7
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	8
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	9
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	10
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	11
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	12
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	13
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	14
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	15
(n)	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	1
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694	2
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579	3
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482	4
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402	5
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335	6
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279	7
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233	8
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194	9
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162	10
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135	11
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112	12
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093	13
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078	14
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065	15

ANNUITY TABLE

Present value of an annuity of 1 i.e. $\frac{1-(1+r)^{-n}}{r}$

Where r = discount rate

n = number of periods

<i>Periods</i> (n)	<i>Discount rates (r)</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	1
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	2
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	3
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	4
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	5
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355	6
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	7
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	8
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	9
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	10
11	10.37	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	11
12	11.26	10.58	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	12
13	12.13	11.35	10.63	9.986	9.394	8.853	8.358	7.904	7.487	7.103	13
14	13.00	12.11	11.30	10.56	9.899	9.295	8.745	8.244	7.786	7.367	14
15	13.87	12.85	11.94	11.12	10.38	9.712	9.108	8.559	8.061	7.606	15
(n)	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	1
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528	2
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106	3
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589	4
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991	5
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326	6
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605	7
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837	8
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031	9
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192	10
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327	11
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439	12
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533	13
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611	14
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675	15