



<b>FACULTY/COLLEGE</b>	College of Business and Economics
<b>SCHOOL</b>	School of Accounting
<b>DEPARTMENT</b>	Commercial Accounting
<b>CAMPUS(ES)</b>	SWC
<b>MODULE NAME</b>	Financial Management
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<b>SEMESTER</b>	Second
<b>ASSESSMENT OPPORTUNITY, MONTH AND YEAR</b>	Supplementary Summative Assessment Opportunity January 2019

<b>ASSESSMENT DATE</b>	6-10 January 2019	<b>SESSION</b>	
<b>ASSESSOR(S)</b>	Mr. E. Ghyoot, Ms. P. Ramutumbu and Ms. L. Pelcher		
<b>MODERATOR(S)</b>	Mr. D. du Plessis		
<b>DURATION</b>	3 hours (180 min)	<b>TOTAL MARKS</b>	100

<b>NUMBER OF PAGES OF QUESTION PAPER (Including cover page)</b>	18
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### INFORMATION/INSTRUCTIONS:

- This is a closed-book assessment.
- There are 6 questions. **Answer question 1 to question 6 (compulsory).** (In total, you must answer 6 questions).
- Read the questions carefully and answer only what is required.
- Number your answers clearly and correctly as per the question paper.
- Write neatly and legibly on both sides of the paper in the answer book, starting on the first page.
- Show all formulae, calculations and workings clearly.
- Please start each question on a new page.
- Silent, non-programmable calculators may be used.
- Where applicable, round all calculations to **two decimal** places, unless stipulated otherwise.
- Indicate your **INDEX NUMBER** on the front cover of your script.

**QUESTION 1****(10 MARKS)**

- 1.1 Below is an extract from the 2019 integrated report of Mr Price Group Ltd:

**Required:**

Name the non-financial objective that is reported on in the extract? **(1)**

- 1.2 Name three methods that can be used to value ordinary shares. **(3)**

- 1.3 Below is an extract from the 2019 integrated report of Mr Price Group Ltd:

## External Environment

This heading indicates acknowledgement towards the external constraints that a financial manager faces.

**Required:**

Indicate three ways that government and regulation has an impact on the challenges of the financial manager. **(3)**

- 1.4 Indicate whether the following statements are **TRUE** or **FALSE**:

1.4.1 The most important threat facing companies in light of globalisation is increased competition. **(1)**

1.4.2 Short term profit decision making will always lead to long term wealth maximisation. **(1)**

- 1.4.3 The interest of stakeholders must be considered when making wealth maximisation decisions. **(1)**

## QUESTION 2

(20 MARKS)

## 2.1 China's Big Banks Are Turning to Short-Term Financing

Bloomberg News

April 2, 2018, 10:00 PM GMT+2 Updated on April 3, 2018, 10:45 AM GMT+2

**Required:**

- 2.1.1 Fill in the missing word in this sentence, taken from the above article:  
"China's biggest lenders are increasingly using short-term financing, in a development that could affect rates on the \_\_\_\_\_ market." (1)
- 2.1.2 Name one financial instrument that would trade on this financial market as referred to above. (1)
- 2.2. Assume you are planning an overseas trip as part of the UJ Choir. The trip will only happen in 6 months. You are concerned that the Rand may weaken in the interim, but you do not yet have the funds to order your forex. On which forex market will you try to secure an exchange rate quote? (1)
- 2.3 Fin24.com published the following headline on 23 Aug 2019:

"JSE softer as bearish sentiment persists"

### JSE softer as bearish sentiment persists

Aug 23 2019 17:39 Musa Makoni, Purple Group

The logo for fin24, with 'fin' in black and '24' in red.**Required:**

- 2.3.1 Describe a characteristic of the market trend referenced in the headline above. (1)
- 2.3.2 Give one reason why an index is not 100% representative of the market. (1)

- 2.4 The following extract from the JSE Ltd report was taken from a recent Sunday newspaper:

Company	Close (cents)	Day move (cents)	12m %	Week Low	Week High	DY	PE Ratio
MONDI PAPER	28850	-1302	-10.48	28166	32394	4.5	9.9
SAPPI PAPER	?	-53	-16.66	4240	5420	4.4	?
YORK TIMBER	171	1	-5	170	181	0	-85

**Additional information:**

- The Earnings Yield for Sappi Paper is 16.12%.
- The price per share of Sappi Paper opened at 4453c per share on the particular day.
- Mondi Paper paid 1298.25c dividend per share.

**Formulae:**

$$PE = MPS \div EPS$$

$$EY = 1 / PE$$

$$DY = DPS \div MPS$$

Please answer the following questions based on the above extract.

**Required:**

- 2.4.1 Why does York Timbers have a negative PE ratio? (1)
- 2.4.2 Give a possible explanation for York Timber having a DY of 0. (1)
- 2.4.3 Calculate the PE for Sappi Paper. (2)
- 2.4.4 Calculate the closing price of the day for Sappi Paper. (1)
- 2.4.5 Calculate at what price Mondi Paper traded at one year ago. HINT: Use an index calculation. (2)
- 2.4.6 Calculate the return shareholders could have earned if they had purchased shares in Mondi Paper exactly one year ago and held on to them for the entire year. Use your answer in 2.4.6. (3)
- 2.4.7 Why is your answer in 2.4.6 above, not the same percentage as the 12m% change of the share as published in the newspaper? (1)

- 2.4.8 Sappi recently released its financial results for the quarter ended June 2019.

Commenting on the results, Sappi Limited Chief Executive Officer, Steve Binnie, said:

*“Although our third quarter is traditionally slower due to northern hemisphere summer holidays, the results for the quarter were under further pressure. We faced challenging market conditions across all our major product categories, but in particular from sluggish graphic paper demand in Europe and North America which necessitated production downtime and weak wood pulp prices due to soft markets. In addition, annual maintenance shutdowns which impacted production and sales volumes were completed at Ngodwana, Saiccor and Cloquet Mills.”*

**Required:**

Identify one factor affecting the share price that is out of the control of management, and one factor that is within their control.

**(2)**

- 2.5 The below is an extract from an article published in FinWeek:

*“[T]here is another important aspect to the global nature of our market, and that is dual listings: some stocks trade not only on the JSE, but also on other exchanges around the world.*

*...*

*So British American Tobacco’s price will be set in London and the JSE price will follow. This can be skewed a fair bit by trading hours; for example, when the LSE only starts its day at 10:00 SA time, we get an hour to set our own price before they open.*

*But ultimately the shares will trade in sync because if they don’t, traders will arbitrage the prices...”*

**Required:**

Explain what arbitrage is.

**(2)**

**QUESTION 3****(10 MARKS)**

3.1 Name and explain briefly two considerations (principles) of the changed environment in which the financial manager operates. **(4)**

3.2 The below extract is from Investec Bank:

Name	Bid	[A]
GBP/ZAR	18.2391 ↓	18.2466
EUR/ZAR	16.5643	16.5694
USD/ZAR	15.1454	15.1484

**Required:**

3.2.1 Indicate the heading that you will expect at [A]. **(1)**

3.2.2 How much ZAR will you need to buy USD50? **(1)**

3.3 The below extract is from Investec Bank in South Africa:

GBP/EUR	1.0981 ↓
GBP/USD	1.2004 ↑
GBP/AUD	1.7853 ↑
GBP/CAD	1.6040 ↑
GBP/CHF	1.1892 ↓
GBP/JPY	127.34 ↓
GBP/NZD	1.9098 ↓
GBP/ZAR	18.2101
EUR/USD	1.0931 ↑
EUR/ZAR	16.5820 ↑

**Required:**

Calculate and write the indirect quotation down of the EUR/ZAR exchange rate? Show all your calculations. **(2)**

- 3.4 A South African company is exporting beer to Switzerland.

	USD	EUR	ZAR	CHF
USD	1	0.9015	14.6903	0.9859
EUR	1.1093	1	16.2849	1.0937
ZAR	0.0681	0.0614	1	0.0672
CHF	1.0143	0.9144	14.8903	1

**Required:**

How much should the South African company disclose in the financial statements if it received CHF 400 from their exports? Show all your calculations.

**(2)**



**QUESTION 4****(20 MARKS)**

The global economy is facing many risks which could severely disrupt economic activity. These risks include an escalation of trade disputes and tightening of global financial conditions, amongst other factors. The widespread sense of uncertainty has put a dampener on investor confidence in financial markets. The following information has been presented as a forecast for a particular investment:

State of the economy	Probability	Possible return
Recession	5%	7%
Normal	??	20%
Good	10%	35%

**Required:**

- 4.1 Calculate the average expected return of the investment. **(5)**
- 4.2 Calculate the standard deviation for the investment. Assume that the expected average return is 20%. **(5)**

Super Bru is considering investing R1 000 000 in a portfolio of shares. The below information has been provided:

	All Blacks	Wallabies	Springboks
<b>Total investment</b>	R500 000	R300 000	R200 000
<b>Expected return 2019</b>	20%	15%	13%
<b>Expected return 2020</b>	22%	17%	15%

**Required:**

- 4.3 Provide a definition for the concept of correlation. **(1)**
- 4.4 What is the ideal correlation for investments within a portfolio? **(1)**
- 4.5 Calculate the weighting of each investment in the portfolio. **(3)**
- 4.6 Calculate the average expected return of the portfolio. Show all your calculations. **(5)**

**QUESTION 5****(20 MARKS)**

- 5.1 When you start working, you would like to move out of your parent's home and buy a property of your own. You have searched for a property on Property24.co.za and identified a townhouse in a suburb that is close to your prospective employer's office block. The property has a selling price of R850 000. You have applied for a home loan from the bank and they are willing you give your financing for a 20 year period at an interest rate of 14% per annum.

**Required:**

Calculate the amount of money that you will need to pay every year towards paying off the home loan. Use your financial calculator and show all of your workings.

**(4)**

- 5.2 Trevor Noah would like to make a contribution towards a good cause in support of Nelson Mandela Day. He has identified an organisation that builds schools. The amount required to build one school is R500 000. He would like to pledge this amount to be paid every year to the organisation for the foreseeable future. Assume that the interest that will be earned on his investment is at a rate is 10% per annum, compounded annually.

**Required:**

Calculate the amount of the lump sum that he would need to contribute. Use the relevant formula and show all of your workings.

**(2)**

- 5.3 Lucas Mamabolo is a professional athlete. He makes his living from running marathons and ultra-marathons. His training program includes training for various marathons across the world. His coach and sponsor are confident that he has the potential to win the following races if he trains consistently for the next 4 years.

Year	Marathon	Winnings
2020	Comrades Marathon	R375 000
2021	Boston Marathon	R400 000
2022	London Marathon	R500 000

**Required:**

Use the applicable interest factor tables to calculate the value of the cash flows in January 2020. Assume that the cash flows will be received at the end of each year. An interest of 8% per annum is applicable.

**(6)**

- 5.4 Your mother is turning 65 years old next year. She will receive a lump sum of R1 000 000 from her pension fund. She needs your assistance to prepare for a meeting with her financial advisor who will assist her with investing the money. She is thinking of investing the money in a fixed deposit account that will provide a return of 13.33% after a period of five years.

**Required:**

Calculate how much her investment will be worth in five years' time. Use the applicable formula and show all of your workings.

**(4)**

- 5.5 You want to start planning for your retirement from your first year of working. You have calculated that you will only be able to save R3000 from your monthly budget towards retirement. You would like to receive a lump sum of R1 000 000 when you retire at age 65. It is likely that your investment will grow at an annual rate of 10% per annum, compounded annually.

**Required:**

Calculate the number of years that it would take to reach your goal of having a lump sum of R1 000 000. Use your financial calculator and show all of your workings.

**(4)**

**QUESTION 6****(20 MARKS)**

- 6.1 Bling Bling Jewelry Store has 10 000 shares at a par value of R10 each. The rate of return on risk free assets is currently 9%. Due to the recent instability in Hong Kong due to the public protests, the risk in global markets is perceived as high and a premium of 8% is considered appropriate. The company has a high business risk and low financial risk. A further premium of 4% is considered appropriate.

There are 11% R20 redeemable preference shares in issue. The preference shares are currently trading at R25 each. The shares are redeemable in 5 years' time at par.

Executive management is considering securing financing in the form of a loan of R200 000. This is the price at which the loan can be fully repaid today. The terms of the agreement from the bank are that the loan is repayable in 4 installments of R65 000 each, at the end of each year. The tax rate is 28%.

**Required:**

- 6.1.1 Calculate the cost of equity. (2)
- 6.1.2 Calculate the cost of preference shares. (5)
- 6.1.3 Calculate the cost of debt. (5)
- 6.1.4 Explain why a jewelry store would have a high business risk. Hint: provide the definition for business risk and apply it to the scenario. (2)

- 6.2 The existing cost of ordinary shares is 15%, the cost of preference shares is 12% and the before tax cost of debt is 9%. The target capital structure is 50% ordinary shares, 20% preference shares and 30% debt. The tax rate is 28%.

**Required:**

- Calculate the weighted average cost of capital. (6)

**[TOTAL = 100]**

## APPENDIX

### Tables:

$$\begin{aligned}
 FV_n &= PV_0 \times FVIF_{i,n} \\
 PV_n &= FV_n \times PVIF_{i,n} \\
 FVA_n &= PMT \times FVIFA_{i,n} \\
 PVA_0 &= PMT \times PVIFA_{i,n} \\
 FVAD_0 &= (PMT \times FVIFA_{i,n}) \times (1 + i) \\
 PVAD_0 &= (PMT \times PVIFA_{i,n} \times (1 + i)
 \end{aligned}$$

### Formulas:

$R = \sum (R_i)(P_i)$
$\sigma = \sqrt{\sum_{i=1}^n (R_i - R)^2 \times P_i}$
$CV = \frac{\sigma}{R}$
$K_p = (W_1 \times K_1) + (W_2 \times K_2) + \dots + (W_n \times K_n)$
$R = \frac{D_t + (P_t - P_{t-1})}{P_{t-1}} \times \frac{100}{1}$
$FV_n = PV_0 \times (1 + i)^n$ $PV_0 = \frac{FV_n}{(1 + i)^n} \quad PV_0 = FV_n \times (1 + i)^{-n}$

$$FVA = PMT \times \left[ \frac{(1+i)^n - 1}{i} \right]$$

$$PVA = PMT \times \left[ \frac{1 - (1+i)^{-n}}{i} \right]$$

$$PV_{\text{Perp}} = \frac{PMT}{i}$$

$$EAR = \left( 1 + \frac{i}{m} \right)^m - 1$$

$$FV = PV_0 \times \left( 1 + \frac{i}{m} \right)^{m \times n}$$

**Table 1: Future value of R1 at the end of  $n$  periods**

$n$	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	1.0000	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200	1.1300	1.1400	1.1500
2	1.0000	1.0201	1.0404	1.0609	1.0816	1.1025	1.1236	1.1449	1.1664	1.1881	1.2100	1.2321	1.2544	1.2769	1.2996	1.3225
3	1.0000	1.0303	1.0612	1.0927	1.1249	1.1576	1.1910	1.2250	1.2597	1.2950	1.3310	1.3676	1.4049	1.4429	1.4815	1.5209
4	1.0000	1.0406	1.0824	1.1255	1.1699	1.2155	1.2625	1.3108	1.3605	1.4116	1.4641	1.5181	1.5735	1.6305	1.6890	1.7490
5	1.0000	1.0510	1.1041	1.1593	1.2167	1.2763	1.3382	1.4026	1.4693	1.5386	1.6105	1.6851	1.7623	1.8424	1.9254	2.0114
6	1.0000	1.0615	1.1262	1.1941	1.2653	1.3401	1.4185	1.5007	1.5869	1.6771	1.7716	1.8704	1.9738	2.0820	2.1950	2.3131
7	1.0000	1.0721	1.1487	1.2299	1.3159	1.4071	1.5036	1.6058	1.7138	1.8280	1.9487	2.0762	2.2107	2.3526	2.5023	2.6600
8	1.0000	1.0829	1.1717	1.2668	1.3686	1.4775	1.5938	1.7182	1.8509	1.9926	2.1436	2.3045	2.4760	2.6584	2.8526	3.0590
9	1.0000	1.0937	1.1951	1.3048	1.4233	1.5513	1.6895	1.8385	1.9990	2.1719	2.3579	2.5580	2.7731	3.0040	3.2519	3.5179
10	1.0000	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	1.9672	2.1589	2.3674	2.5937	2.8394	3.1058	3.3946	3.7072	4.0456
11	1.0000	1.1157	1.2434	1.3842	1.5395	1.7103	1.8983	2.1049	2.3316	2.5804	2.8531	3.1518	3.4785	3.8359	4.2262	4.6524
12	1.0000	1.1268	1.2682	1.4258	1.6010	1.7959	2.0122	2.2522	2.5182	2.8127	3.1384	3.4985	3.8960	4.3345	4.8179	5.3503
13	1.0000	1.1381	1.2936	1.4685	1.6651	1.8856	2.1329	2.4098	2.7196	3.0658	3.4523	3.8833	4.3635	4.8980	5.4924	6.1528
14	1.0000	1.1495	1.3195	1.5126	1.7317	1.9799	2.2609	2.5785	2.9372	3.3417	3.7975	4.3104	4.8871	5.5348	6.2613	7.0757
15	1.0000	1.1610	1.3459	1.5580	1.8009	2.0789	2.3966	2.7590	3.1722	3.6425	4.1772	4.7846	5.4736	6.2543	7.1379	8.1371
16	1.0000	1.1726	1.3728	1.6047	1.8730	2.1829	2.5404	2.9522	3.4259	3.9703	4.5950	5.3109	6.1304	7.0673	8.1372	9.3576
17	1.0000	1.1843	1.4002	1.6528	1.9479	2.2920	2.6928	3.1588	3.7000	4.3276	5.0545	5.8951	6.8660	7.9861	9.2765	10.7613
18	1.0000	1.1961	1.4282	1.7024	2.0258	2.4066	2.8543	3.3799	3.9960	4.7171	5.5599	6.5436	7.6900	9.0243	10.5752	12.3755
19	1.0000	1.2081	1.4568	1.7535	2.1068	2.5270	3.0256	3.6165	4.3157	5.1417	6.1159	7.2633	8.6128	10.1974	12.0557	14.2318
20	1.0000	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	3.8697	4.6610	5.6044	6.7275	8.0623	9.6463	11.5231	13.7435	16.3665
21	1.0000	1.2324	1.5157	1.8603	2.2788	2.7860	3.3996	4.1406	5.0338	6.1088	7.4002	8.9492	10.8038	13.0211	15.6676	18.8215
22	1.0000	1.2447	1.5460	1.9161	2.3699	2.9253	3.6035	4.4304	5.4365	6.6586	8.1403	9.9336	12.1003	14.7138	17.8610	21.6447
23	1.0000	1.2572	1.5769	1.9736	2.4647	3.0715	3.8197	4.7405	5.8715	7.2579	8.9543	11.0263	13.5523	16.6266	20.3616	24.8915
24	1.0000	1.2697	1.6084	2.0328	2.5633	3.2251	4.0489	5.0724	6.3412	7.9111	9.8497	12.2392	15.1786	18.7881	23.2122	28.6252
25	1.0000	1.2824	1.6406	2.0938	2.6658	3.3864	4.2919	5.4274	6.8485	8.6231	10.8347	13.5855	17.0001	21.2305	26.4619	32.9190
26	1.0000	1.2953	1.6734	2.1566	2.7725	3.5557	4.5494	5.8074	7.3964	9.3992	11.9182	15.0799	19.0401	23.9905	30.1666	37.8568
27	1.0000	1.3082	1.7069	2.2213	2.8834	3.7335	4.8223	6.2139	7.9881	10.2451	13.1100	16.7386	21.3249	27.1093	34.3899	43.5353
28	1.0000	1.3213	1.7410	2.2879	2.9987	3.9201	5.1117	6.6488	8.6271	11.1671	14.4210	18.5799	23.8839	30.6335	39.2045	50.0656
29	1.0000	1.3345	1.7758	2.3566	3.1187	4.1161	5.4184	7.1143	9.3173	12.1722	15.8631	20.6237	26.7499	34.6158	44.6931	57.5755
30	1.0000	1.3478	1.8114	2.4273	3.2434	4.3219	5.7435	7.6123	10.0627	13.2677	17.4494	22.8923	29.9599	39.1159	50.9502	66.2118

**Table 2: Present value of R1 at the end of  $n$  periods**

$n$	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	1.0000	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696
2	1.0000	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561
3	1.0000	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575
4	1.0000	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718
5	1.0000	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972
6	1.0000	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323
7	1.0000	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759
8	1.0000	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506	0.3269
9	1.0000	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3606	0.3329	0.3075	0.2843
10	1.0000	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220	0.2946	0.2697	0.2472
11	1.0000	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149
12	1.0000	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186	0.2858	0.2567	0.2307	0.2076	0.1869
13	1.0000	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625
14	1.0000	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413
15	1.0000	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401	0.1229
16	1.0000	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069
17	1.0000	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929
18	1.0000	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808
19	1.0000	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703
20	1.0000	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1037	0.0868	0.0728	0.0611
21	1.0000	0.8114	0.6598	0.5375	0.4388	0.3589	0.2942	0.2415	0.1987	0.1637	0.1351	0.1117	0.0926	0.0768	0.0638	0.0531
22	1.0000	0.8034	0.6468	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839	0.1502	0.1228	0.1007	0.0826	0.0680	0.0560	0.0462
23	1.0000	0.7954	0.6342	0.5067	0.4057	0.3256	0.2618	0.2109	0.1703	0.1378	0.1117	0.0907	0.0738	0.0601	0.0491	0.0402
24	1.0000	0.7876	0.6217	0.4919	0.3901	0.3101	0.2470	0.1971	0.1577	0.1264	0.1015	0.0817	0.0659	0.0532	0.0431	0.0349
25	1.0000	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0736	0.0588	0.0471	0.0378	0.0304
26	1.0000	0.7720	0.5976	0.4637	0.3607	0.2812	0.2198	0.1722	0.1352	0.1064	0.0839	0.0663	0.0525	0.0417	0.0331	0.0264
27	1.0000	0.7644	0.5859	0.4502	0.3468	0.2678	0.2074	0.1609	0.1252	0.0976	0.0763	0.0597	0.0469	0.0369	0.0291	0.0230
28	1.0000	0.7568	0.5744	0.4371	0.3335	0.2551	0.1956	0.1504	0.1159	0.0895	0.0693	0.0538	0.0419	0.0326	0.0255	0.0200
29	1.0000	0.7493	0.5631	0.4243	0.3207	0.2429	0.1846	0.1406	0.1073	0.0822	0.0630	0.0485	0.0374	0.0289	0.0224	0.0174
30	1.0000	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0151



**Table 3: Future value of an annuity of R1 per period for  $n$  periods**

$n$	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0100	2.0200	2.0300	2.0400	2.0500	2.0600	2.0700	2.0800	2.0900	2.1000	2.1100	2.1200	2.1300	2.1400	2.1500
3	3.0301	3.0604	3.0909	3.1216	3.1525	3.1836	3.2149	3.2464	3.2781	3.3100	3.3421	3.3744	3.4069	3.4396	3.4725
4	4.0604	4.1216	4.1836	4.2465	4.3101	4.3746	4.4399	4.5061	4.5731	4.6410	4.7097	4.7793	4.8498	4.9211	4.9934
5	5.1010	5.2040	5.3091	5.4163	5.5256	5.6371	5.7507	5.8666	5.9847	6.1051	6.2278	6.3528	6.4803	6.6101	6.7424
6	6.1520	6.3081	6.4684	6.6330	6.8019	6.9753	7.1533	7.3359	7.5233	7.7156	7.9129	8.1152	8.3227	8.5355	8.7537
7	7.2135	7.4343	7.6625	7.8983	8.1420	8.3938	8.6540	8.9228	9.2004	9.4872	9.7833	10.0890	10.4047	10.7305	11.0668
8	8.2857	8.5830	8.8923	9.2142	9.5491	9.8975	10.2598	10.6366	11.0285	11.4359	11.8594	12.2997	12.7573	13.2328	13.7268
9	9.3685	9.7546	10.1591	10.5828	11.0266	11.4913	11.9780	12.4876	13.0210	13.5795	14.1640	14.7757	15.4157	16.0853	16.7858
10	10.4622	10.9497	11.4639	12.0061	12.5779	13.1808	13.8164	14.4866	15.1929	15.9374	16.7220	17.5487	18.4197	19.3373	20.3037
11	11.5668	12.1687	12.8078	13.4864	14.2068	14.9716	15.7836	16.6455	17.5603	18.5312	19.5614	20.6546	21.8143	23.0445	24.3493
12	12.6825	13.4121	14.1920	15.0258	15.9171	16.8699	17.8885	18.9771	20.1407	21.3843	22.7132	24.1331	25.6502	27.2707	29.0017
13	13.8093	14.6803	15.6178	16.6268	17.7130	18.8821	20.1406	21.4953	22.9534	24.5227	26.2116	28.0291	29.9847	32.0887	34.3519
14	14.9474	15.9739	17.0863	18.2919	19.5986	21.0151	22.5505	24.2149	26.0192	27.9750	30.0949	32.3926	34.8827	37.5811	40.5047
15	16.0969	17.2934	18.5989	20.0236	21.5786	23.2760	25.1290	27.1521	29.3609	31.7725	34.4054	37.2797	40.4175	43.8424	47.5804
16	17.2579	18.6393	20.1569	21.8245	23.6575	25.6725	27.8881	30.3243	33.0034	35.9497	39.1899	42.7533	46.6717	50.9804	55.7175
17	18.4304	20.0121	21.7616	23.6975	25.8404	28.2129	30.8402	33.7502	36.9737	40.5447	44.5008	48.8837	53.7391	59.1176	65.0751
18	19.6147	21.4123	23.4144	25.6454	28.1324	30.9057	33.9990	37.4502	41.3013	45.5992	50.3959	55.7497	61.7251	68.3941	75.8364
19	20.8109	22.8406	25.1169	27.6712	30.5390	33.7600	37.3790	41.4463	46.0185	51.1591	56.9395	63.4397	70.7494	78.9692	88.2118
20	22.0190	24.2974	26.8704	29.7781	33.0660	36.7856	40.9955	45.7620	51.1601	57.2750	64.2028	72.0524	80.9468	91.0249	102.4436
21	23.2392	25.7833	28.6765	31.9692	35.7193	39.9927	44.8652	50.4229	56.7645	64.0025	72.2651	81.6987	92.4699	104.7684	118.8101
22	24.4716	27.2990	30.5368	34.2480	38.5052	43.3923	49.0057	55.4568	62.8733	71.4027	81.2143	92.5026	105.4910	120.4360	137.6316
23	25.7163	28.8450	32.4529	36.6179	41.4305	46.9958	53.4361	60.8933	69.5319	79.5430	91.1479	104.6029	120.2048	138.2970	159.2764
24	26.9735	30.4219	34.4265	39.0826	44.5020	50.8156	58.1767	66.7648	76.7898	88.4973	102.1742	118.1552	136.8315	158.6586	184.1678
25	28.2432	32.0303	36.4593	41.6459	47.7271	54.8645	63.2490	73.1059	84.7009	98.3471	114.4133	133.3339	155.6196	181.8708	212.7930
26	29.5256	33.6709	38.5530	44.3117	51.1135	59.1564	68.6765	79.9544	93.3240	109.1818	127.9988	150.3339	176.8501	208.3327	245.7120
27	30.8209	35.3443	40.7096	47.0842	54.6691	63.7058	74.4838	87.3508	102.7231	121.0999	143.0786	169.3740	200.8406	238.4993	283.5688
28	32.1291	37.0512	42.9309	49.9676	58.4026	68.5281	80.6977	95.3388	112.9682	134.2099	159.8173	190.6989	227.9499	272.8892	327.1041
29	33.4504	38.7922	45.2189	52.9663	62.3227	73.6398	87.3465	103.9659	124.1354	148.6309	178.3972	214.5828	258.5834	312.0937	377.1697
30	34.7849	40.5681	47.5754	56.0849	66.4388	79.0582	94.4608	113.2832	136.3075	164.4940	199.0209	241.3327	293.1992	356.7868	434.7451

**Table 4: Present value of an annuity of R1 per period for  $n$  periods**

$n$	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4437	2.4018	2.3612	2.3216	2.2832
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.1024	3.0373	2.9745	2.9137	2.8550
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6959	3.6048	3.5172	3.4331	3.3522
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.2305	4.1114	3.9975	3.8887	3.7845
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.7122	4.5638	4.4226	4.2883	4.1604
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	5.1461	4.9676	4.7988	4.6389	4.4873
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.5370	5.3282	5.1317	4.9464	4.7716
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.8892	5.6502	5.4262	5.2161	5.0188
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	6.2065	5.9377	5.6869	5.4527	5.2337
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.4924	6.1944	5.9176	5.6603	5.4206
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.7499	6.4235	6.1218	5.8424	5.5831
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.9819	6.6282	6.3025	6.0021	5.7245
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	7.1909	6.8109	6.4624	6.1422	5.8474
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	7.3792	6.9740	6.6039	6.2651	5.9542
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.5488	7.1196	6.7291	6.3729	6.0472
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.7016	7.2497	6.8399	6.4674	6.1280
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.8393	7.3658	6.9380	6.5504	6.1982
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.9633	7.4694	7.0248	6.6231	6.2593
21	18.8570	17.0112	15.4150	14.0292	12.8212	11.7641	10.8355	10.0168	9.2922	8.6487	8.0751	7.5620	7.1016	6.6870	6.3125
22	19.6604	17.6580	15.9369	14.4511	13.1630	12.0416	11.0612	10.2007	9.4424	8.7715	8.1757	7.6446	7.1695	6.7429	6.3587
23	20.4558	18.2922	16.4436	14.8568	13.4886	12.3034	11.2722	10.3711	9.5802	8.8832	8.2664	7.7184	7.2297	6.7921	6.3988
24	21.2434	18.9139	16.9355	15.2470	13.7986	12.5504	11.4693	10.5288	9.7066	8.9847	8.3481	7.7843	7.2829	6.8351	6.4338
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	8.4217	7.8431	7.3300	6.8729	6.4641
26	22.7952	20.1210	17.8768	15.9828	14.3752	13.0032	11.8258	10.8100	9.9290	9.1609	8.4881	7.8957	7.3717	6.9061	6.4906
27	23.5596	20.7069	18.3270	16.3296	14.6430	13.2105	11.9867	10.9352	10.0266	9.2372	8.5478	7.9426	7.4086	6.9352	6.5135
28	24.3164	21.2813	18.7641	16.6631	14.8981	13.4062	12.1371	11.0511	10.1161	9.3066	8.6016	7.9844	7.4412	6.9607	6.5335
29	25.0658	21.8444	19.1885	16.9837	15.1411	13.5907	12.2777	11.1584	10.1983	9.3696	8.6501	8.0218	7.4701	6.9830	6.5509
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.6938	8.0552	7.4957	7.0027	6.5660