



## CHARTERED ACCOUNTANTS EXAMINATIONS

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### PROFESSIONAL LEVEL

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### P3: STRATEGIC FINANCIAL MANAGEMENT

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FRIDAY 17 JUNE 2016

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TOTAL MARKS – 100; TIME ALLOWED: THREE (3) HOURS

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#### **INSTRUCTIONS TO CANDIDATES**

1. You have fifteen (15) minutes reading time. Use it to study the examination paper carefully so that you understand what to do in each question. You will be told when to start writing.
2. This paper is divided into TWO sections:  
Section A: One (1) compulsory question.  
Section B: Four (4) Optional Questions. Attempt any three (3) questions.
3. Enter your student number and your National Registration Card number on the front of the answer booklet. Your name must **NOT** appear anywhere on your answer booklet.
4. Do **NOT** write in pencil (except for graphs and diagrams).
5. **Cell Phones** are **NOT** allowed in the Examination Room.
6. The marks shown against the requirement(s) for each question should be taken as an indication of the expected length and depth of the answer.
7. All workings must be done in the answer booklet.
8. Formulae, Present Value, Annuity and normal distribution tables are attached at the end of the question paper.
9. Graph paper (if required) is provided at the end of the answer booklet.

## **SECTION A**

**Attempt this one compulsory question.**

### **QUESTION ONE**

Kuto Plc's managers' are investigating the possibility of manufacturing special clay pots, made of special clay from the source of the river Zambezi, in Mwinilunga district which is in the north western part of Zambia.

The summary statement of financial position of Kuto Plc is as follows:

K	K		
Share capital of 50 ngwee per share	52,000	Non-Current Assets	336,000
Retained profits	<u>202,000</u>		
Shareholders' funds	254,000		
Non-current liabilities	Current assets		
6% bank loan	<u>156,000</u>	less current liabilities	<u>74,000</u>
Total equity and liabilities	<u>410,000</u>	Total assets	<u>410,000</u>

Kuto Plc's shares are currently trading at K3.50 per share and has a beta value of 1.35

The managers' team estimate that in the first year, the selling price would be K1,000 per clay pot, the variable cost would be K400 per clay pot and the total direct fixed costs would be K1,500,000. The selling price for the clay pots is expected to increase by 8% per year, the variable and fixed costs are expected to increase by 5% per year, for the next four years.

Additional manufacturing costs as a percentage of variable costs are expected to be 120% in the first year, 40% in the second year and 10% in each of the following three years. Additional working capital will be required for the project of 20% of the first year's sales revenue. Thereafter every K1 increase in sales revenue will require a 10% increase in working capital.

The estimated number of clay pots to be produced and sold per year is given as follows:

Year	1	2	3	4	5
Number of clay pots produced and sold	7,500	20,000	50,000	60,000	95,000

There is considerable uncertainty as to the exact quantity that could be produced and sold and the estimated standard deviation of number of clay pots produced and sold is expected to be as much as 30%.

Plant and equipment costing K120,000,000 will need to be acquired to facilitate the production and selling of the clay pots. Tax allowable depreciation is available on plant and equipment at 10% straight line basis. The residual value of plant and equipment is expected to be K40,000,000.

Saku Plc, a competitor to Kuto Plc, has been operating in the clay pots industry for many years and its summary financial Statements are as follows:

	K		K
Share capital of K1 per share	125,000	Non-Current assets	417,000
Retained profits	<u>357,000</u>		
Shareholders' funds	482,000		
Non-current liabilities		Current assets less	
5% bank loan	<u>92,000</u>	Current liabilities	<u>157,000</u>
Total equity and liabilities	<u>574,000</u>	Total assets	<u>574,000</u>

Saku Plc's shares are valued at K3 per share. Its loan notes are trading at K102 per K100. Saku Plc's beta has been quoted at 1.82. Saku Plc has offered to buy Kuto Plc's clay pot rights for K107, 000,000 after the development phase had been completed in two years' time.

Other financial data:

- a. The rate of return on Treasury bills is 3% and market risk premium is 6%.
- b. Tax rate applicable to both Kuto and Saku Plc is 30%. Assume that tax is paid in the same year as the profits on which it is charged.

**Required:**

- (a) Prepare a report to the Board of Directors of Kuto Plc that evaluates the financial viability of the proposed clay pot investment by Kuto Plc's managers before undertaking the Saku Plc's offer. (22 marks)
- (b) Calculate the value of the above project if Kuto Plc takes the Saku Plc's offer using the Black-Scholes Model. (8 marks)
- (c) Briefly discuss ethical issues that might need to be considered as part of the project investment decision process. (10 marks)

**[Total: 40 Marks]**

## **SECTION B**

**Attempt any THREE (3) Questions out of FOUR (4) in this section.**

### **QUESTION TWO**

Marka International, a company quoted on the local stock exchange, has decided to diversify into a new sector in order to reduce its risk. However, the company has not decided whether to diversify through acquisition of an existing business in the new sector or to establish a new company (organic growth). Marka International has cash balances of K240 million which are currently invested in short-term money market deposits.

The company has identified a possible acquisition target, EZK Ltd, a smaller quoted company in the new sector. Even though EZK Ltd is quoted, approximately 60% of its shares are still owned by four directors. These directors have stated that they might be prepared to recommend the sale of EZK Ltd, but they consider the total value of its shares to be worth K235 million. As a Finance Manager of Marka International, you have been asked to establish if the value given by the directors is reasonable. The following financial information has been provided:

#### **Summarised financial data**

	<i>Marka</i>	<i>EZK</i>
	K'm	K'm
Turnover	530	88
Pre- tax operating cash flow	101	55
Taxation (30%)	<u>30.3</u>	<u>16.5</u>
Post- tax operating cash flow	70.7	38.5
Dividend	<u>12</u>	<u>10.03</u>
Retained earnings	58.7	28.47

#### **Statement of financial position**

Non-current assets (net)	218	58
Current assets	185	54
Current liabilities	<u>149</u>	<u>51</u>
	<u>254</u>	<u>61</u>
Financed by		
Ordinary shares (50n par)	60	(EZK 15n par) 4.5
Reserves	139	52.1
12% Debentures 20X7	40	-
10% Bank term loan	15	-
Recent 11% bank loan	<u>-</u>	<u>4.4</u>
	<u>254</u>	<u>61</u>

Current share price	885 ngwee	460 ngwee
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Average dividend growth during the last five years	8% p.a.	10% p.a.
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Equity beta	0.85	1.01
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#### **Industry data:**

Average P/E ratio	9:1	7:1
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Average P/E of companies recently taken over, based upon the offer price 10:1 5:1

The risk free rate of return is 7% per annum and the market return 15% per annum.

#### **Other information:**

1. After the acquisition some land and buildings of EZK would be sold for K8 million (after tax).
  2. Following the acquisition, it's expected that 145 employees of EZK would immediately be made redundant at an after tax cost of K10 million. Pre-tax annual wage savings are expected to be K1 million. Pre-tax advertising and distribution savings are expected to be K750, 000 per year.
  3. The four existing directors of EZK would each be paid an after tax consultancy fees of K500,000 per year for four years for consultancy services if the acquisition succeeds. This amount would not increase with inflation.

### **Ignore inflation**

### **Required:**

- (a) Estimate the value of EZK Ltd using the following valuation methods:

  - (i) The comparative P/E ratios (2 marks)
  - (ii) The dividend valuation model (4 marks)
  - (iii) The present value of relevant operating cash flows over a fifteen (15) year period. (7 marks)

(b) Advise whether, Marka International should proceed with the acquisition of EZK Ltd shares. (3 marks)

(c) Explain whether diversification through mergers and acquisitions is an effective means of reducing risk and securing future growth for Marka International. (4 marks)

**[Total: 20 Marks]**

### **QUESTION THREE**

Gumboot Plc. a Zambian based company is evaluating the effect of its financing strategy on the performance of its two subsidiary companies Wing Plc. and Fly Plc. Both subsidiaries are also based in Zambia.

An extract of financial information for the companies for two consecutive years is shown below:

	Wing Plc.		Fly Plc.	
Years	2011	2010	2011	2010
Turnover (Km)	150	100	180	140
Price earnings ratio	5	6	2	4
Profit before interest (Km)	11	10.5	36	18

The market value of Wing Plc. shares is K2 each while the market value of Fly Plc. shares is K5 each.

Both companies pay corporation tax at 35% per annum.

#### **Required:**

- (a) Calculate the degree of financial gearing (DFG) for each company and interpret your results. (8 marks)
- (b) Discuss the factors Gumboot Plc. should consider in determining the capital structure of its subsidiaries. (8 marks)
- (c) Explain why the directors of Gumboot Plc. may be reluctant to obtain further debt finance. (4 marks)

**[Total: 20 Marks]**

### **QUESTION FOUR**

Pod Ltd is a construction company based in Ndola while Mob Ltd is a Lusaka based Insurance Company. Pod Ltd can borrow from commercial banks for six months at a floating rate of 3% or at a fixed rate of 9%. Mob Ltd can borrow from commercial banks for six months at a floating rate of 5% or at a fixed rate of 7%. Pod Ltd desires a fixed rate loan while Mob Ltd desires a floating rate loan.

The finance director of the two companies recently met in Zambia to discuss a possible fixed-for-floating rate swap. They agreed to find a suitable swap bank to seal the deal.

A swap bank was finally identified. The swap bank agreed to receive fixed rate payments of 8.5% from Pod Ltd and variable rate payments of 4% from Mob Ltd.

**Required:**

- (a) Calculate the net savings in percentage terms that will accrue to Pod Ltd, Mob Ltd and the swap bank as a result of entering into the interest rate swap agreement. (11 marks)
- (b) Discuss the main features and advantages of interest rate swaps as compared to forward rate agreements and forward contracts. (9 marks)

**[Total: 20 Marks]**

**QUESTION FIVE**

G-Gri is a privately-owned entity based in Livingstone, Zambia. Its principal business is the manufacture and sale of a wide variety of items for the tourist market, mainly souvenirs, gifts and local traditional wear. Currently the Zambian government is considering entering into a trade bloc specifically for the tourism sector in order to boost trade. G-Gri manufactures approximately 70% of the goods it sells. The remaining 30% is purchased from other neighbouring countries that are within the proposed trade bloc. G-Gri owns and operates six retail stores across the country. It also sells its products on a wholesale basis to other local retail outlets.

G-Gri sole financial objective is to increase dividends each year. It has no non-financial objective. This financial objective and the lack of non-financial objectives are shortly to be subject to review and discussion by the board. The new Finance Director believes maximization of shareholder wealth should be the sole objective, but the other directors do not agree and think that new objectives should be considered, including target profit after tax and return on investment.

**Required**

- (a) Discuss whether the proposed trade bloc will stimulate or impair international trade. (8 marks)
- (b) Evaluate the appropriateness of G-Gri's current objective and of the two new objectives being considered. (6 marks)
- (c) Discuss alternative objectives that might be appropriate for G-Gri and provide a recommendation. (6 marks)

**[Total: 20 Marks]**

**END OF PAPER**

### Modified Internal Rate of Return

$$MIRR = \left[ \frac{PV_R}{PV_I} \right]^{\frac{1}{n}} (1 + r_e) - 1$$

### The Black-Scholes option pricing model

$$C = P_a N(d_1) - P_e N(d_2) e^{-rt}$$

Where:

$$d_1 = \frac{\ln(P_a / P_e) + (r + 0.5s^2)t}{s\sqrt{t}}$$

$$d_2 = d_1 - s\sqrt{t}$$

### The Put Call Parity relationship

$$P = C - P_a + P_e e^{-rt}$$

### Present Value Table

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

Where      r = discount rate  
                 n = number of periods until payment

Periods (n)	Discount rate (r)									
	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	0.705	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	0.911	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	0.305
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
(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
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	0.074	0.065

### 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

Periods (n)	Discount rate (r)									
	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	10.37	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.26	10.58	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.13	11.35	10.63	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.00	12.11	11.30	10.56	9.899	9.295	8.745	8.244	7.786	7.367
15	13.87	12.85	11.94	11.12	10.38	9.712	9.108	8.559	8.061	7.606
(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
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	4.793	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

**Standard normal distribution table**

	0·00	0·01	0·02	0·03	0·04	0·05	0·06	0·07	0·08	0·09
0·0	0·0000	0·0040	0·0080	0·0120	0·0160	0·0199	0·0239	0·0279	0·0319	0·0359
0·1	0·0398	0·0438	0·0478	0·0517	0·0557	0·0596	0·0636	0·0675	0·0714	0·0753
0·2	0·0793	0·0832	0·0871	0·0910	0·0948	0·0987	0·1026	0·1064	0·1103	0·1141
0·3	0·1179	0·1217	0·1255	0·1293	0·1331	0·1368	0·1406	0·1443	0·1480	0·1517
0·4	0·1554	0·1591	0·1628	0·1664	0·1700	0·1736	0·1772	0·1808	0·1844	0·1879
0·5	0·1915	0·1950	0·1985	0·2019	0·2054	0·2088	0·2123	0·2157	0·2190	0·2224
0·6	0·2257	0·2291	0·2324	0·2357	0·2389	0·2422	0·2454	0·2486	0·2517	0·2549
0·7	0·2580	0·2611	0·2642	0·2673	0·2704	0·2734	0·2764	0·2794	0·2823	0·2852
0·8	0·2881	0·2910	0·2939	0·2967	0·2995	0·3023	0·3051	0·3078	0·3106	0·3133
0·9	0·3159	0·3186	0·3212	0·3238	0·3264	0·3289	0·3315	0·3340	0·3365	0·3389
1·0	0·3413	0·3438	0·3461	0·3485	0·3508	0·3531	0·3554	0·3577	0·3599	0·3621
1·1	0·3643	0·3665	0·3686	0·3708	0·3729	0·3749	0·3770	0·3790	0·3810	0·3830
1·2	0·3849	0·3869	0·3888	0·3907	0·3925	0·3944	0·3962	0·3980	0·3997	0·4015
1·3	0·4032	0·4049	0·4066	0·4082	0·4099	0·4115	0·4131	0·4147	0·4162	0·4177
1·4	0·4192	0·4207	0·4222	0·4236	0·4251	0·4265	0·4279	0·4292	0·4306	0·4319
1·5	0·4332	0·4345	0·4357	0·4370	0·4382	0·4394	0·4406	0·4418	0·4429	0·4441
1·6	0·4452	0·4463	0·4474	0·4484	0·4495	0·4505	0·4515	0·4525	0·4535	0·4545
1·7	0·4554	0·4564	0·4573	0·4582	0·4591	0·4599	0·4608	0·4616	0·4625	0·4633
1·8	0·4641	0·4649	0·4656	0·4664	0·4671	0·4678	0·4686	0·4693	0·4699	0·4706
1·9	0·4713	0·4719	0·4726	0·4732	0·4738	0·4744	0·4750	0·4756	0·4761	0·4767
2·0	0·4772	0·4778	0·4783	0·4788	0·4793	0·4798	0·4803	0·4808	0·4812	0·4817
2·1	0·4821	0·4826	0·4830	0·4834	0·4838	0·4842	0·4846	0·4850	0·4854	0·4857
2·2	0·4861	0·4864	0·4868	0·4871	0·4875	0·4878	0·4881	0·4884	0·4887	0·4890
2·3	0·4893	0·4896	0·4898	0·4901	0·4904	0·4906	0·4909	0·4911	0·4913	0·4916
2·4	0·4918	0·4920	0·4922	0·4925	0·4927	0·4929	0·4931	0·4932	0·4934	0·4936
2·5	0·4938	0·4940	0·4941	0·4943	0·4945	0·4946	0·4948	0·4949	0·4951	0·4952
2·6	0·4953	0·4955	0·4956	0·4957	0·4959	0·4960	0·4961	0·4962	0·4963	0·4964
2·7	0·4965	0·4966	0·4967	0·4968	0·4969	0·4970	0·4971	0·4972	0·4973	0·4974
2·8	0·4974	0·4975	0·4976	0·4977	0·4977	0·4978	0·4979	0·4979	0·4980	0·4981
2·9	0·4981	0·4982	0·4982	0·4983	0·4984	0·4984	0·4985	0·4985	0·4986	0·4986
3·0	0·4987	0·4987	0·4987	0·4988	0·4988	0·4989	0·4989	0·4989	0·4990	0·4990

This table can be used to calculate  $N(d)$ , the cumulative normal distribution functions needed for the Black-Scholes model of option pricing. If  $d_i > 0$ , add 0·5 to the relevant number above. If  $d_i < 0$ , subtract the relevant number above from 0·5.

## JUNE 2016: STRATEGIC FINANCIAL MANAGEMENT (P3)

### SOLUTIONS

#### **SOLUTION ONE**

##### **a. Report to the Kuto plc Board of Directors**

Subject: Assessment of the investment in special Clay pots

This report recommends whether or not Kuto plc would benefit by investing in the special clay pots, by considering the following alternatives open to it and explains the approach taken in each case and the assumptions made:

- (i) The value of the investment without the Saku plc offer to buy the project on completion of the two year development phase.
- (ii) The value of the project after taking into account Saku plc's offer.

Based on the calculations in the appendices, from the cost and revenue estimates provided, the net present value before considering the Saku plc's offer is negative at K13.5million approximately (working 1). However, after taking into account the value of the put option, the net present value is positive at K16.7million approximately. Therefore, it would be beneficial for Kuto plc to undertake the investment project, if it can decide whether to continue with the project or sell it to Saku plc for K107million after a period of two years. However, without this option it should not proceed with the project.

Kuto plc will not actually obtain the value of the option, however the option value takes into account the volatility or uncertainty of the project. In this case, it indicates that the project is worth pursuing because the volatility may result in increases in the future cash flows and the project becomes profitable.

Therefore, the time Kuto plc has before it needs to make a decision is reflected in the value of the project by considering real options using the Black Scholes model.

### **Working 1 - Net present value in K'000**

Year	0	1	2	3	4	5
Sales revenue (W2)		7,500	21,600	58,300	75,540	129,200
Less:						
Variable costs (W3)	(3,000)	(8,400)	(22,050)	(27,780)	(46,170)	
Fixed costs	(1,500)	(1,575)	(1,654)	(1,736)	(1,823)	
Manufacturing costs	(3,600)	(3,360)	(2,205)	(2,778)	(4,617)	
Cash flows before tax	(600)	8,265	32,391	43,246	76,590	
Tax at 30%	180	(2,480)	(9,717)	(12,974)	(22,977)	
Machinery	(120,000)				40,000	
Tax relief on WDA	3,600	3,600	3,600	3,600	9,600	
Working capital	(1,500)	(1,410)	(3,670)	(1,724)	(5,366)	13,670
Net cash flows	(121,500)	1,770	5,715	24,550	28,506	116,883
DF at 12%	1.000	0.893	0.797	0.712	0.636	0.567
Present values	(121,500)	1,581	4,555	17,480	18,130	66,273

Net present value = (K13,481,000)

### **Working 2 - Sales revenue in K'000**

Year	1	2	3	4	5
No of pots produced and sold	7,500	20,000	50,000	60,000	95,000
Unit price (K)	1,000	1,080	1,166	1,259	1,360
Sales revenue (K'000)	7,500	21,600	58,300	75,540	129,200

### **Working 3 - Variable costs in K'000**

Year	1	2	3	4	5
No of pots produced and sold	7,500	20,000	50,000	60,000	95,000
Unit cost (K)	400	420	441	463	486
Variable costs (K'000)	3,000	8,400	22,050	27,780	46,170

### **Working 4 - manufacturing costs**

		K'000
Year 1	120% x 3,000	3,600
Year 2	40% x 8,400	3,360
Year 3	10% x 22,050	2,205
Year 4	10% x 27,780	2,778
Year 5	10% x 46,170	4,617

### **Working 5 - Capital allowances (tax depreciation)**

Year	Tax depreciation K'000	Tax relief at 30% K'000
0	Initial cost 120,000	
1	Tax depreciation 10% x 120,000 12,000	3,600
2	Tax depreciation 10% x 120,000 12,000	3,600
3	Tax depreciation 10% x 120,000 12,000	3,600
4	Tax depreciation 10% x 120,000 12,000	3,600
5	120,000 – (12,000 x 4yrs) – 40,000 = 32,000	9,600

### **Working 6 - Working Capital**

		K'000
Year 0	20% x 7,500	1,500
Year 1	21,600 – 7,500 x 10%	1,410
Year 2	58,300 – 21,600 x 10%	3,670
Year 3	75,540 – 58,300 x 10%	1,724
Year 4	129,200 – 75,540 x 10%	5,366
Year 5	Working capital release (1,500 + 1,410 + 3,670 + 1,724 + 5,366)	13,670

### **Working 7 - Asset beta of the project**

$$\begin{aligned}\beta_a &= \beta_e \times \frac{V_e}{V_e + V_d(1 - t)} \\ &= 1.82 \times \frac{375,000}{375,000 + 93,840(1 - 0.30)} \\ &= 1.82 \times \frac{375,000}{440,688} \\ &= 1.549\end{aligned}$$

### **Working 8 - Equity beta of the project**

$$\begin{aligned}\beta_e &= \beta_a \times \frac{V_e + V_d(1 - t)}{V_e} \\ &= 1.549 \times \frac{364,000 + 156,000(1 - 0.30)}{364,000} \\ &= 1.549 \times \frac{473,200}{364,000} \\ &= 2.014\end{aligned}$$

### **Working 9 - Cost of equity**

$$\begin{aligned}K_e &= R_f + (R_m - R_f)\beta \\ &= 3\% + (6\% \times 2.014) \\ &= 15.08\%\end{aligned}$$

### **Working 10 - Cost of Capital**

$$\begin{aligned} \text{WACC} &= \frac{K_e \times V_e}{V_e + V_d} + \frac{K_d(1 - t) \times V_d}{V_e + V_d} \\ &= \frac{15.08 \times \underline{364,000}}{520,000} + \frac{6(1 - 0.20) \times \underline{156,000}}{520,000} \\ &= 10.56 + 1.44 \\ &= 12\% \end{aligned}$$

### **Working 11 - Market value of equity – Saku plc**

$$\begin{aligned} \text{Equity value} &= \text{market price} \times \text{No of shares} \\ &= K3 \times 125,000 \\ &= K375,000 \end{aligned}$$

### **Working 12 - Market value of equity – Kuto plc**

$$\begin{aligned} \text{Equity value} &= \text{market price} \times \text{No of shares} \\ &= K3.50 \times 104,000 \\ &= K364,000 \end{aligned}$$

### **Working 13 - Market value of debt – Saku plc**

$$\begin{aligned} \text{Debt} &= \text{Market price} \times \text{book value} \\ &= K1.02 \times 92,000 \\ &= K93,840 \end{aligned}$$

**Note:** The question had referred loan notes as bank loan with 5%. Therefore, students who used bank loan of K92, 000 were marked correct also.

### **Working 14 - Market value of debt – Kuto plc**

$$\begin{aligned} \text{Debt} &= \text{Book value of 6% bank loan} \\ &= K156,000 \end{aligned}$$

#### **b. Value of Put option**

##### **(i) Black Scholes input variables**

Present value of underlying asset ( $P_a$ ) = K101,883. This is the sum of the present values of the cash flows forgone in years 3, 4 and 5.

Price offered by Saku plc ( $P_e$ ) = K107,000

Risk free rate of interest ( $r$ ) = 3%

Volatility of underlying asset ( $s$ ) = 30%

Time to expiry of option ( $t$ ) = 2 years

(ii) Computation of d1

$$d1 = \frac{\ln(Pa/Pe) + (r + 0.5s^2)t}{S\sqrt{t}}$$

$$= \frac{\ln(101,883/107,000) + (0.030 + 0.5 \times 0.30^2)2}{0.30 \times \sqrt{2}}$$

$$= \frac{\ln 0.95218 + 0.15}{0.4242640687}$$

$$= 0.238$$

(iii) Computation of d2

$$d2 = d1 - S\sqrt{t}$$

$$= 0.238 - (0.30 \times \sqrt{2})$$

$$= 0.238 - 0.424$$

$$= -0.186$$

(iv) Computation of N(d1)

$$d1 = 0.238$$

$$= 0.24$$

$$\begin{aligned}N(d1) &= 0.50 + 0.0948 \\&= 0.5948\end{aligned}$$

(v) Computation of N(d2)

$$d2 = -0.186$$

$$= -0.19$$

$$\begin{aligned}N(d2) &= 0.50 - 0.0753 \\&= 0.4247\end{aligned}$$

(vi) Value of Call option

$$\begin{aligned}C &= PaN(d1) - PeN(d2)e^{-rt} \\&= (101,883 \times 0.5948) - 107,000 \times 0.4247 \times e^{-0.03 \times 2} \\&= 60,600 - 45,443 \times e^{-0.06} \\&= 60,600 - 45,443 \times 0.9417645336 \\&= 60,600 - 42,797 \\&= 17,803\end{aligned}$$

(vii) Value of a Put option – using the Put call parity approach

$$\begin{aligned}P &= c - Pa + Pe \times e^{-rt} \\&= 17,803,000 - 101,883,000 + 107,000,000 \times e^{-0.06} \\&= 17,803,000 - 101,883,000 + (107,000,000 \times 0.9417645336) \\&= 17,803,000 - 101,883,000 + 100,768,805 \\&= 16,688,805\end{aligned}$$

$$\begin{aligned}
 \text{(viii) Net present value with put option} &= 16,688,805 - 13,481,000 \\
 &= \text{K3,207,805}
 \end{aligned}$$

### c. Ethical issues for consideration

Companies may engage in activities which whilst not illegal are questionable ethically and may have detrimental long term effects on the company's reputation. Ethical considerations include:

- (i) Would the investment cause pollution or other environmental damage in the country?
- (ii) Does the investment involve experiments on animals, genetic modifications etc?
- (iii) Should the investment be undertaken if the country has a poor record on human rights?
- (iv) If the local officials ask for 'inducements' to facilitate the investment process, should these be paid?
- (v) Would the investment in any way assist trading in drugs or arms?
- (vi) Are wages to be paid below subsistence levels? Are working conditions of an acceptable standard?
- (vii) Use of child labour
- (viii) Discrimination against women, ethnic minorities
- (ix) Provision of proper safety equipment and working conditions for employees.

## **SOLUTION TWO**

a)

i) **P/E ratios**

Since EZK Ltd operates in a different sector, the comparative P/E ratio valuation must be based upon the average P/E ratios in that sector. The P/E ratio of 5 will therefore be used.

Value of EZK Ltd is **K192.5 million** ( $5 \times 38.5\text{m}$ )

ii) Dividend valuation model

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

$$\begin{aligned}
 ke &= Rf + \beta (E(Rm) - Rf) \\
 Ke &= 7\% + 1.01 (15\% - 7\%) \\
 &= 15.08\%
 \end{aligned}$$

$$\begin{aligned}
 P_o &= 10.03 (1.10) / 0.1508 - 0.10 \\
 &= \text{K219.19million}
 \end{aligned}$$

iii) Cash flow valuation method

	K'm
Current pre-tax operating cash flow	55
Post -acquisition adjustments:	
Annual wage savings	1
Advertising/distribution savings	<u>0.75</u>
	56.75
Taxation (30%)	17.02
Annual post tax cash flow	<u>39.73</u>

The other post tax cash flows to be taken into account are:

	K'm
1. Redundancy costs	10
2. Sale of land and buildings	8
3. Consultancy service (0.5m x 4)	2

Cost of capital

Market value (30 x 4.6)	= K138
Market value of debt	= <u>K4.4</u>
Total	<u>K142.4</u>

Cost of debt =  $11\% \times (1-0.3) = 7.7\%$

$$\text{WACC} = 15.08\% \times 138/142.4 + 7.7\% \times 4.4/142.4$$

$$= 14.61 + 0.24$$

$$= 14.85\% \text{ Say } 15\%$$

Discounted cash flows using 15% as discount rate:

	K'm
Annual post tax cash flow (39.73 x 5.847)	= 232.3
Redundancy costs (10 x 1.000)	= (10)
Sale of land & buildings (8 x 1.000)	= 8
Consultancy services (2 x 2.855)	= <u>(5.71)</u>
Present value of cash flows	<u>224.59</u>

Value of the company **K224.59million**

**b)**

The three valuation methods have produced the price range of K184.51million to K197.44 million which is below the proposed offer price of K235million. This may indicate that the company is over- priced by the directors. The present value of the operating cash flows (which is possibly the best of the three approaches) gives the lowest valuation of K184.51million suggesting further that EZK Ltd could be overpriced.

Marka international can make a counter offer at this price and if the acquisition of EZK Ltd would be in line with Marka's long-term strategic objectives, then it is recommended that the acquisition should proceed. However, it's worth to note that the valuations methods used have limitations. For example the present value method has ignored any **likely changes** in the **pattern of the cash flows** following the acquisition as well as any strategic plans that the company may have for such a long time frame.

**c)**

A strategy of diversification does not always provide a sound rationale for merger or an acquisition. One problem is that the synergies identified are often more difficult to achieve when two businesses, which are quite different in nature are combined. Such differences may, for example, prevent Marka from benefiting from economies of scale or the use of complementary resources. Similarly, although the management team of Marka may be highly efficient and highly motivated, it may not have the necessary skills to replace the management team of the Acquired business.

There may also be problems in trying to integrate the operations of two different kinds of business because of differences in market need, business culture and so on. Marka has always been in the manufacturing industry and the management team may therefore have a number challenges adapting to the management of a company in a completely new sector.

Diversification is a useful way of dealing with risk and it is therefore intuitively appealing to see mergers and takeovers as a useful means to achieve this end. The question that must be asked however is whether the directors of the company should diversify or the shareholders should diversify individually. It is usually easier and cheaper for the shareholders to diversify, by acquiring a diversified portfolio of shares than for the directors to diversify. When the directors of a company diversify, by taking over another company, a significant premium is often paid to the shareholders of the target company. This evidence by what the Directors of EZK Ltd are offering compared to the estimated value.

### **SOLUTION THREE**

a)

	WING		FLY	
	2010	2011	2010	2011
PBIT(km)	K10.5	K11	K18	K36
EPS workings below	K0.33	K0.4	K1.25	K2.5

EPS = MPS/PE ratio

Wing

2011 2/5=K0.4

2010 2/6=K0.33

Fly  
2011      5/2=K2.5  
2012      5/4=K1.25

DFG=change in EPS/change in PBIT

WING PLC  
21.2%/4.76%=4.45

FLY PLC  
100%/100%=1

The degree of financial gearing measures the sensitivity of EPS to changes in EBIT.

The DFG of Wing Plc. is greater than 1. EPS changes by more than the changes in EBIT due to the effect of the degree in financial gearing, 'the multiplier'. This shows that the capital structure of Wing Plc. has a component of debt finance.

The DFG of FLY Plc. =1. The change in EPS is equal to the changes in EBIT. This shows that there is no component of debt capital in Fly Plc. capital structure.

b) 1) Taxation

The impact on the company's overall tax position will need to be considered, also how tax efficient the alternative sources of finance are.

2) Clientele effect

When considering whether to change gearing significantly, directors may take into account changes in the profile of shareholders. If gearing does change significantly, the company may adjust to a new risk return trade off that is unsuitable for many shareholders. These shareholders will look to sell their shares, whilst other investors, who are now attracted by the new gearing levels, will look to buy shares.

3) Bankruptcy risk

Increasing the level of debt may increase the probability of default as the company has much more exposed volatility in earnings. Higher levels of debt may also increase the cost of borrowing making repayment of debt more difficult and triggering financial distress. The company may therefore choose a level of debt that balances the benefits of debt with the costs of bankruptcy.

4) Signalling

Some investors may see the issue of debt capital as a sign that the directors are confident enough of the future cash flows of the business to be prepared to commit the company to making regular interest payments to lenders.

c)

- 1) They fear that the company may be unable to service the debt, to make the required capital and interest payments on time.
- 2) The tax position is such that they will be unable to use the tax shield, to obtain any tax benefits from interest payments.
- 3) The company lacks the asset base to be able to generate additional cash if needed or provide sufficient security.
- 4) The company wishes to maintain access to the capital markets on good terms and hence needs a good credit rating.

## **SOLUTION FOUR**

**(a)**

Pod Ltd desires a fixed rate loan but it has access to lower floating rate loans compared to Mob Ltd. Mob Ltd desires a floating rate loan but it has access to lower fixed rate loans compared to Pod Ltd.

Pod will borrow at a floating rate of 3% from the commercial bank and pay the swap bank 8.5%. Mob Ltd will borrow fixed at 7% from the commercial bank and pay the swap bank 4% floating rate.

Pod Ltd will pay 8.5% fixed interest rate to the swap bank instead of 9% to the commercial bank. Pod Ltd will save 0.5% interest (9%-8.5%).

Mob Ltd will pay floating rate of 4% to the swap bank instead of 5% to the commercial bank. Mob Ltd will save 1% interest (5%-4%).

The Swap bank will receive 8.5% fixed interest from Pod Ltd and it will pay 7% fixed interest on behalf of Mob to the commercial bank. The Swap Bank will save 1.5% interest (8.5% -7%).

The Swap bank will receive from Mob Ltd 4% Floating rate interest and pay 3% floating rate interest to the commercial bank on behalf of Pod Ltd. The Swap bank will save 1% interest (4%-3%).

**b)** A forward rate agreement (FRA) is an OTC contract to lend or borrow a given sum of money in future at an interest rate that is agreed today. It can be used as to hedge against unfavourable movements in interest rates in future.

A forward contract is an agreement to buy or sell a given amount of currency in the future at an exchange rate that is agreed today. It can be used to hedge against unfavourable movements in future exchange rates.

Interest rate swaps are transactions that take advantage of different interest rates in different markets for borrowing, to reduce interest costs for either fixed or floating rate loans. An interest rate swap is an arrangement whereby two companies swap interest rate commitments with each other.

The main advantages of a swap as compared with other hedging instruments are as follows:

- 1) Transaction costs are low being limited to legal fees
- 2) They are flexible since they can be arranged in any size and they can be reversed if necessary
- 3) Companies with different credit ratings can borrow at the best cost in the market that is most accessible to them and then swap this benefit with another company to reduce the mutual borrowing costs.
- 4) Swaps allow capital restructuring by changing the nature of interests commitments without the need to redeem debt or to issue new debt, thus reducing transaction costs.

## **SOLUTION FIVE**

### **a) Nature of trade blocs**

Trade blocs exist when there is no restriction on the movement of goods and services between countries. Trade blocs are also often customs unions where there is free trade between member countries of the bloc, and also common external tariffs applying to imports into any member countries.

#### **Effects of trade bloc**

Within members of the bloc, trade is likely to increase for the following reasons:

##### **(i) Fewer barriers**

Some barriers, such as physical barriers to trade, may have been removed. Other barriers, for example technical standards may have been harmonised.

##### **(ii) Better use of resources**

Increased competition is likely to mean better use of resources as more efficient producers within the bloc have greater marketing opportunities at the expense of less efficient rivals.

Overall prices for many goods and services should fall and demand rise and trade creation occur. This will particularly apply the more similar the economies within the bloc are.

##### **(iii) Economies of scale**

Bigger potential markets allow opportunities for increased specialisation and economies of scale.

##### **(iv) Capital movements**

As well as market opportunities, trade blocs are likely to involve free movement of capital, hence allowing greater availability and encouraging more investment by businesses.

##### **(v) Government coordination**

A co-ordinated approach by governments across the bloc on issues such as competition regulation is likely to be effective in removing barriers to entry and ending uncompetitive arrangements than actions taken by individual governments.

(vi) **Long-term implications**

Trade blocs may have long-term effects that stimulate trade, for example allowing the introduction of new technologies or providing incentives for governments to improve infrastructure and thus lower transport costs.

Trade blocs have a potentially negative effect on trade with nations outside the bloc. How great this effect is depends on the level of tariffs that are set.

(vii) **Less efficient producers**

The imposition of tariffs may mean that less efficient producers within the bloc benefit at the expense of more efficient producers outside (a process known as trade diversion).

(viii) **Retaliation**

Imposition of tariffs may lead to retaliation by countries outside the bloc. This may hit hard countries within the bloc that previously had good relations with outside countries.

(ix) **Effect on less successful economies**

The benefits may only be felt by certain members within the bloc, those with the most efficient businesses or those with the best transport links. The depressive effect on the economies of the less successful members may hit overall trade within the bloc.

### **Conclusion**

Thus a trade bloc should be successful in increasing trade within the bloc, but trading relationships with external countries may be damaged if barriers are significant.

b)

Maximisation of shareholder wealth is the theoretically ideal corporate objective. However, most organisations now recognise that having this as their sole objective is unrealistic. Whilst there is still the philosophy that shareholders' wealth should be improved as much as possible, this is usually within the constraints of other objectives, such as legal obligations relating to the environment, ethical considerations (not using 'sweat-shop' labour for example) and health and safety issues.

G-Gri has the additional problem of trying to value shareholder wealth. It is not listed on the stock exchange and thus has no quoted share price set by market forces. If there are problems valuing wealth, how can the entity determine how to maximise it?

### **Increasing dividends v maximising shareholder wealth**

The objective of increasing dividends each year does not necessarily support the maximisation of shareholder wealth. If there are profitable investments available that would increase future wealth, then the entity should ideally be using its funds to finance such investments.

By increasing dividends each year, the entity is restricting the funds available for profitable investments and thus its ability to improve shareholder wealth. Most organisations have a target payout ratio (dividends as a percentage of profit available to shareholders) which means that dividends will move in relation to fluctuations in profit. This makes more sense than a situation where dividends are increasing whilst profits are actually falling.

### **Accounting ratios**

Some of the directors have suggested accounting ratios such as Return on Investment (ROI) as more suitable objectives. One of the main benefits of such accounting ratios is that they are easy to understand and are comparable across time and between other similar entities in the same industry. However there are several issues with using accounting ratios as objectives, including:

- (i) The numbers are easy to manipulate, even when governed by accounting standards
- (ii) The ratios are based on historic numbers rather than future cash flows, which can cause problems with comparisons if the entity is about to undergo, or has just undergone, a substantial change in structure
- (iii) Lack of consideration for non-financial objectives

**Target profit after tax** is another objective being considered. As with accounting ratios, profit figures are easy to understand and determining whether target has been achieved is a straightforward comparison exercise. However the problem with such a measure is that taxation policies are beyond the control of individual entities. Changes in such policies render comparisons between years useless unless time-consuming (and potentially inaccurate) restatement of figures takes places.

**c)**

### **Alternative objectives**

As a private entity, it is difficult for G-Gri to have objectives related to shareholder wealth given the difficulties described above in determining value. Dividends alone are unlikely to be a good measure of shareholder wealth and should perhaps be considered in conjunction with other measures such as earnings growth. Ratios measuring growth are likely to be more meaningful than absolute measures such as 'increasing dividends' every year and are more likely to make sense. There is no point having such an objective if profits from which dividends are paid are falling.

Given the above evaluation it would seem more sensible for G-Gri to have a range of complementary objectives rather than focusing on just one. It may be worthwhile consulting the shareholders themselves to determine what they are trying to get out of their involvement with G-Gri. From the results of this consultation the directors may be able to come up with suitable objectives for the entity that meet the needs of the majority.

## **END OF SOLUTIONS**