THE INSTITUTE OF CHARTERED ACCOUNTANTS OF ZIMBABWE

Initial Test of Competence
Professional Paper 4

JANUARY 2015

TOTAL MARKS – 100
READING TIME – 30 minutes
WRITING TIME – 150 minutes

INSTRUCTIONS TO CANDIDATES

1 Enter your examination number on the front of the answer book. Your name must not appear anywhere.
2 You are reminded that answers may **NOT** be written in pencil.
3 The marks shown against the requirement(s) for each question should be taken as an indication of the expected length and the required depth of the answer.
- **Even if it is not explicitly required, you should show workings and cross-reference them to your answer.**
- Marks are awarded for appropriate arrangement and layout, clarity of explanation, logical argument and clear and concise language.

Disclaimer clause: All names of persons, places and business entities mentioned in this examination paper are fictitious and any resemblance to real persons, living or dead, places and business entities are purely coincidental.

NOTES
1 The questions in this paper are not intended to reflect the reality of the Zimbabwean economy. Hence reference to exchange rates, interest rates, return on capital, etc., are to be taken at face value and there is an assumption that financial instruments such as foreign exchange contracts will be freely available. Where necessary, an effective tax rate of 25,75% should be used
2 Any proposed amendments to tax legislation from the National Budget announced in November 2014 ARE NOT EXAMINABLE in this ITC.

QUESTION 1

100 marks

Aquazania Tanks (Pvt) Ltd ('Aquazania') is a manufacturer of water storage tanks for use in farming, industrial and residential applications. The water storage tanks are used to collect rainwater for irrigating small crop fields or gardens and providing drinking water for livestock and also for use in sanitation by commercial and industrial customers. Water has become a scarce resource globally and there is increasing focus on conserving this precious resource. The demand for Aquazania's products has grown dramatically in recent times as more and more companies and households embrace water conservation practices.

Aquazania manufactures a limited range of vertical water storage tanks made from polyethylene, a type of plastic. These tanks are used above the ground to collect rainwater directly or from rooftops.

The company previously used to manufacture tanks ranging in size from 250 litres to 15 000 litres. In 2008 Aquazania discontinued the manufacture of tanks that are smaller than 5 000 litres in size, as the company found that manufacturing too wide a product range was not cost efficient. The company still sells smaller water storage tanks but these are procured from outsourced suppliers.

Aquazania currently manufactures the following three products only:

Product reference	Storage capacity
WS5	5 000 litres
WS10	10 000 litres
WS15	15 000 litres

Aquazania uses a manufacturing process called rotational moulding to produce water storage tanks. The manufacturing process essentially involves three steps:

- The polyethylene powder ('powder') is loaded into a mould which is then transferred into a large oven, where it is slowly rotated. The heat and rotational movement, both of which are controlled by computers, result in the powder melting into the shape of the mould.
- The mould is then cooled by removing the heat while continuing to rotate the mould inside the oven.
- The hollow plastic tank is later removed from the mould and various components (e.g. pipe fittings and water level indicators) are attached to the tank.

1 Forecasts for the 2016 financial year

The company's manufacturing plant and equipment are nearing the end of their useful lives and sales volumes are being constrained by production capacity.

The financial manager of Aquazania has produced the following production and sales forecast, together with relevant notes, for the financial year ending 29 February 2016 ('FY2016') for review by the board of directors:

Aquazania Forecast for 12 months ending 29 February 2016					
	Notes	**WS5**	**WS10**	**WS15**	**Total**
Units to be produced and sold		3 500	7 500	3 000	14 000
Expected selling price per unit		$550	$1 050	$1 600	
Manufacturing forecasts					
Machine hours per unit		1,2	1,6	1,8	
Total machine hours	1.1	4 200	12 000	5 400	21 600
Direct labour hours per unit		6,0	10,0	10,0	
Total direct labour hours	1.2	21 000	75 000	30 000	126 000
Powder per unit (kg)		80,0	180,0	300,0	
Direct production costs					
Direct labour cost per hour		$9,50	$9,50	$9,50	
Powder cost per kilogram	1.3	$2,02	$2,02	$2,02	
Component cost per unit		$32,50	$39,00	$45,00	
		$ per unit	**$ per unit**	**$ per unit**	**$**
Production overheads					
Total variable production overheads	1.4				518 400
Allocation of variable production overheads based on machine hours		28,80	38,40	43,20	
Fixed production overheads					1 168 000
Surplus direct labour costs	1.2				50 540
Depreciation of machinery					48 000
Other	1.5				1 069 460
Allocation of fixed production overheads based on total revenue		44,00	84,00	12 800	
Gross profit margin					
Selling price		550,00	1 050,00	1 600,00	
Powder cost		(161,60)	(363,60)	(606,00)	
Direct labour		(57,00)	(95,00)	(95,00)	
Components		(32,50)	(39,00)	(45,00)	
Variable production overheads		(28,80)	(38,40)	(43,20)	
Fixed production overheads		(44,00)	(84,00)	(128,00)	
Gross profit per unit		226,10	430,00	682,80	
Gross profit percentage		41,1%	40,9%	42,7%	

Aquazania Forecast for 12 months ending 29 February 2016 (cont.)					
	Notes	WS5	WS10	WS15	Total
					$
Manufacturing profit summary					
Revenue					14 600 000
Powder cost					(5 110 600)
Direct labour					(1 197 000)
Components					(541 250)
Variable production overheads					(518 400)
Fixed production overheads					(1 168 000)
Gross profit					6 064 750

Notes

1.1 The theoretical annual capacity is 24 000 machine hours. However, planned maintenance and an annual three-week production shut-down result in a maximum production capacity of plant and equipment over the 12-month period ending 29 February 2016 of 21 600 machine hours.

1.2 Available direct labour hours per annum are currently 131 320 hours. The surplus direct labour hours (5 320 hours) are not allocated directly to units produced but rather included in fixed production overheads.

1.3 Polyethylene prices tend to track changes in the prevailing crude oil price, which is denominated in USD. Prices also vary depending on the global demand versus the supply of polyethylene.

1.4 Variable production overheads comprise mainly electricity, water and consumables used in the manufacturing process. Aquazania has historically allocated variable production overheads based on machine hours. These are regarded as the most appropriate indicator of electricity, water and consumables usage in the manufacturing process.

1.5 Other fixed production overheads comprise mainly indirect salaries, wages and rental costs.

2 FY2017 to FY2021 forecasts using new manufacturing equipment

Aquazania is considering investing in new manufacturing equipment. If they do invest, the equipment will be installed and operational by 1 March 2016. The existing equipment will be scrapped if the new equipment is acquired and management does not expect to receive any value for the existing equipment. The estimated cost of the new equipment is $5 million. This will include the cost of new moulds and industrial design services. The expected economic and useful life of the new equipment is 285 000 machine hours and it will have no residual value at the end of its useful life.

The estimated production and sales for the year ending 28 February 2017, using the new equipment, are summarised in the table below:

Aquazania Forecast for 12 months ending 28 February 2017					
	Notes	**WS5**	**WS10**	**WS15**	**Total**
Units to be produced and sold	2.1	3 500	8 250	3 000	14 750
Expected selling price per unit	2.2, 2.8	$594	$1 176	$1 728	
Manufacturing forecasts					
Machine hours per unit		1,2	1,5	1,6	
Total machine hours	2.3	4 200	12 375	4 800	21 375
Direct labour hours per unit		6,0	9,0	9,0	
Total direct labour hours	2.4	21 000	74 250	27 000	122 250

Notes

2.1 The demand for WS5 and WS15 products is expected to remain at FY2016 levels for the foreseeable future. However, the demand for WS10 is increasing and Aquazania estimates that it can manufacture and sell the following units per annum of this product:

	FY2017	**FY2018**	**FY2019**	**FY2020**	**FY2021**
Annual number of WS10 units to be manufactured and sold	8 250	9 000	9 750	10 500	11 250

2.2 The selling price increase for WS5 and WS15 is targeted to be 8% per annum for the forecast period (FY2017 to FY2021).

2.3 The annual production capacity of the new equipment is 36 000 machine hours per annum, after taking into account scheduled maintenance downtime and annual holidays.

2.4 Aquazania has not required labourers to work overtime in recent years due to production capacity constraints. Should overtime be necessary, existing labourers would be able to work a maximum of 25% more hours annually, provided they are paid 150% of normal hourly rates for overtime worked. There are no plans to retrench any workers for the foreseeable future.

2.5 Powder usage for each product is expected to remain the same as in FY2016 throughout the forecast period. Component costs of each product are expected to increase by 6,0% per annum from FY2017 to FY2021.

2.6 Fixed production overheads, excluding depreciation and surplus direct labour, are expected to increase by 7% per annum over the forecast period. The current infrastructure is sufficient to cater for expected growth over the forecast period.

2.7 Sales and marketing expenditure has historically been 2,5% of revenue and this is expected to continue in the future.

2.8 The following information relates to WS10 for the forecast period:

Aquazania Forecast for FY2017 to FY2021					
	FY2017	FY2018	FY2019	FY2020	FY2021
	$	$	$	$	$
Selling price per unit of WS10	1 176,00	1 270,08	1 371,68	1 481,41	1 600,00
Powder cost per kilogram	2,27	2,45	2,65	2,85	3,08
Direct labour cost per hour	10,45	11,28	12,19	13,16	14,21
Component cost per unit of WS10	41,34	43,82	46,45	49,23	52,19
Variable production overheads per machine hour	25,92	27,99	30,23	32,65	35,26

The selling price of WS10 is to be increased by 12% in FY2017, in view of planned design enhancements to the product and the expected increased demand.

3 Analysis of investing in new equipment

The board of directors has requested an incremental net present value analysis of investing in the new equipment versus retaining the status quo to confirm whether the investment is economically viable.

The requested analysis is to be performed based on the following assumptions:

- A pre-tax weighted average cost of capital of 15% is used for Aquazania;
- The taxation and working capital consequences are ignored;
- The analysis is based on a five-year period commencing on 1 March 2016;
- All cash flows occur at the beginning or end of the year, whichever is appropriate; and
- The forecast machine hours and direct labour hours per unit manufactured in FY2017 remain constant throughout the next four years.

3.1 Status quo

Aquazania could operate the existing equipment for the period FY2017 to FY2021 provided it spends an extra $100 000 annually on repairs and maintenance. If Aquazania were to pursue this option, the planned production and sales quantities for FY2016 would have to be maintained (i.e. no volume growth would be possible) throughout this period and it would service its existing customer base only. The selling price increases of WS10 over the period FY2017 to FY2021 would be 6,0% per annum if this option is pursued.

Given the production constraints currently being experienced, maintaining the status quo would allow competitors the opportunity to increase their market share, particularly with regard to the WS10 product.

4 Allocation of fixed production overheads

The board of directors of Aquazania has questioned whether the allocation of fixed production overheads using relative revenue values of products sold is appropriate. It would appear that this favours products with a lower revenue value, which may be inaccurate. The board has requested that an analysis be performed to determine whether allocating fixed

production overheads based on direct labour hours or machine hours would provide a better reflection of the absorption of fixed overheads during the manufacturing process.

5 Funding of new manufacturing equipment

Aquazania currently has $1 million surplus cash available to invest in the new equipment. It will need to raise the balance required, amounting to $4 million, from external sources. The company has received two proposals to fund the planned capital expenditure.

5.1 Ziggy Commercial Bank ('Ziggy')

Ziggy is Aquazania's commercial banker and has offered to advance a $4 million loan to the company on the following terms and conditions:

- The loan will be advanced on 29 February 2016 and will be repayable in five equal annual repayments, with the first instalment due on 28 February 2017;
- The loan will bear interest at a fixed rate of 10,0% per annum; and
- The loan will be secured by a cession and pledge of Aquazania's trade receivables and a notarial general bond over inventories.

5.2 ADF Infrastructure Fund ('ADF')

ADF has offered to subscribe for preference shares to be issued by Aquazania. The preference shares will be created and issued on the following terms and conditions:

- 40 000 preference shares will be issued at $100 per share for a total subscription price of $4 million on 29 February 2016;
- The preference shareholders will have no voting rights;
- The preference shareholders will be entitled to receive annual dividends in arrears, equivalent to 7% of the total subscription price and it will be cumulative; and
- The preference shares will be redeemable at a premium of 10% on the total subscription price on 28 February 2021 or convertible into 5% of the total ordinary shares in issue of Aquazania at the time, at the election of Aquazania.

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INITIAL TEST OF COMPETENCE, JANUARY 2015

PROFESSIONAL PAPER 4

This question consists of two parts. Answer each part in a separate answer book.

QUESTION 1, PART II – REQUIRED		Marks	
		Sub-total	Total
(e)	Discuss each of the two finance proposals available to Aquazania to fund the acquisition of the these and recommend which option should be pursued by the company. Include any further issues that may need to be clarified with regard to each proposal.	11	
	Communication skills – logical argument	*1*	12
(f)	Identify and describe the key business risks that Aquazania faces for the foreseeable future, assuming that the company invests in the new manufacturing equipment.	16	
	Communication skills – clarity of expression	*1*	17
Total for part II			**29**

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INITIAL TEST OF COMPETENCE, JANUARY 2015

PROFESSIONAL PAPER 4

This question consists of two parts. Answer each part in a separate answer book.

QUESTION 1, PART I – REQUIRED		Marks	
		Sub-total	Total
(a)	Calculate the forecast gross profit margin per unit for each of the WS5, WS10 and WS15 products for FY2017 assuming that – • the new equipment is purchased and installed by 1 March 2016; and • fixed production overheads are allocated to products using machine hours.	15	15
(b)	Calculate what the forecast gross profit margin per unit for each of the WS5, WS10 and WS15 products in FY2016 if fixed production overheads are allocated using direct labour hours.	6	6
(c)	Analyse and discuss the forecast gross profit of Aquazania for FY2017, based on your calculations in part (a), in comparison to the FY2016 forecast gross profit, based on your calculations in part (b). *Communication skills – clarity of expression*	12 *1*	13
(d)	Determine the expected incremental cash flow in FY2019 (financial year commencing 1 March 2018 and ending on 28 February 2019) of investing in the new equipment relative to retaining the status quo. Round off your answer to the nearest hundred and present value your answer to 1 March 2016. *Communication skills – layout and structure*	36 *1*	37
Total for part I			**71**