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NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2022

MATHEMATICAL LITERACY: PAPER I

MARKING GUIDELINES

Time: 3 hours

150 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

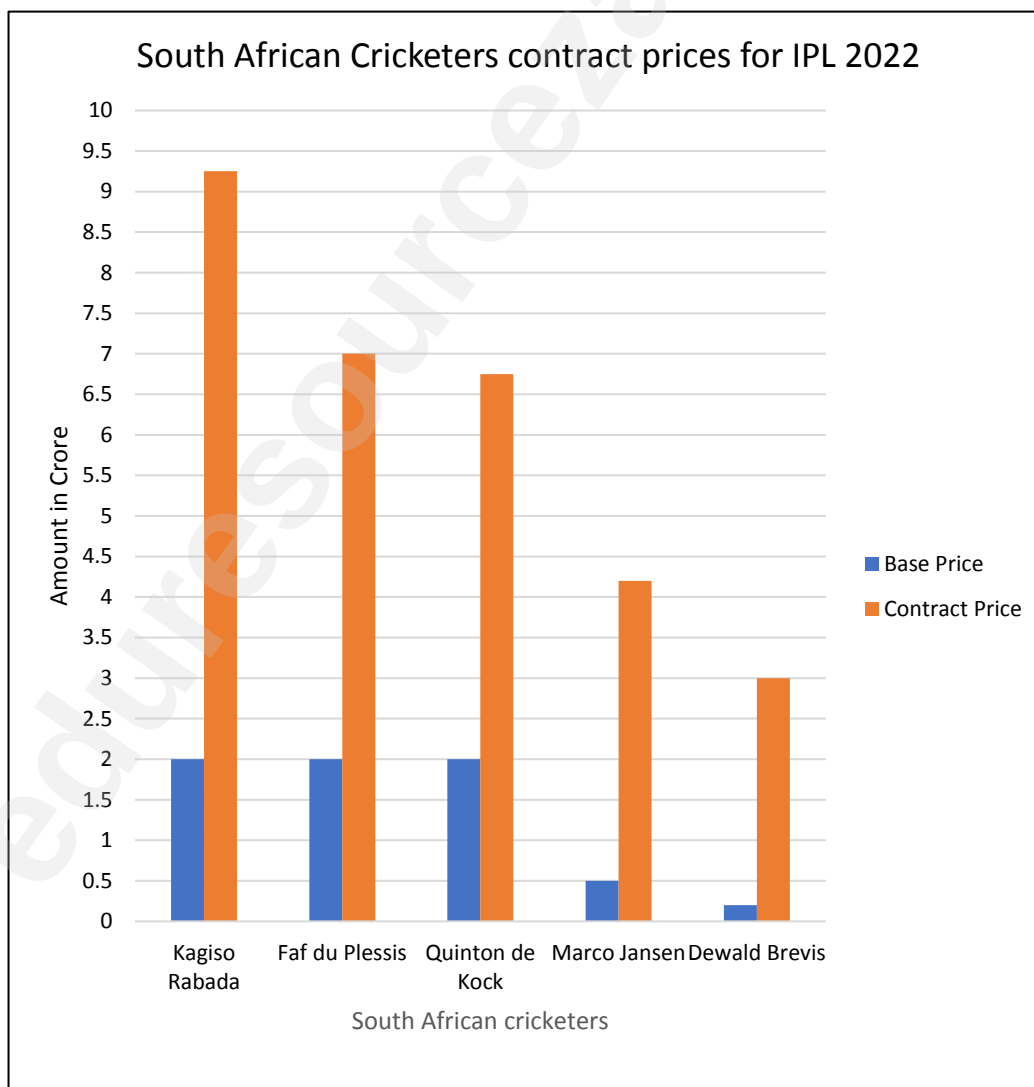
The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

Q1	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data handling P Probability	1 KN 2 RP 3 MSP 4 R&R
1.1.1	31/12/2021 or 31 December 2021	31/12/2021	F	1
1.1.2	Invoice or Tax Invoice	Invoice	F	1
1.1.3	Phone: 021 851 7124 Email: hiqswest@gmail.com In person: 17 Mountain Road OR Phone or email or at 17 mountain road	Phone or 021 851 7124 email OR hiqswest@gmail.com In person or 17 mountain Rd	F	1
1.1.4	R. Gumede 17 Mountain Road Somerset West 7130 17 mountain Road	R. Gumede 17 Mountain Road Somerset West 7130	F	1
1.1.5 (a)	R271,30	R271,30	F	1
1.1.5 (b)	Nedbank	Nedbank	F	1
1.1.5 (c)	Value added Tax	Value added Tax	F	1
1.1.6	= R1 780 ÷ 2 = R890	dividing by 2 R890	F	1

1.1.7	$= R1\,780 : R300$ $= \frac{R1\,780}{R1\,780} : \frac{R300}{R1\,780}$ $= 1 : 0.17$ OR use the price before VAT $R1\,547,84 : R260,87$ $\frac{R1\,547,84}{R1\,547,84} : \frac{R260,57}{R1\,547,84}$ $= 1 : 0.17$ OR $= R1\,780 : R260$ $= \frac{R1\,780}{R1\,780} : \frac{R260}{R1\,780}$ $= 1 : 0.15 \quad \text{One only}$ OR $= R1\,547,84 : R300$ $= \frac{R1\,547,84}{R1\,547,84} : \frac{R300}{R1\,547,84}$ $= 1 : 0.19 \quad \text{One only}$	R1 780:R300 1:0,17	F	1
1.2.1	Histogram	Histogram	D	1
1.2.2	R6 000	R6 000	D	1
1.2.3	24 Months	24 Months	D	1
1.2.4	If they have less than 2 mm tread	less than 2 mm tread	D	1
1.2.5	36%	36%	D	1
1.2.6 (a)	$= R1\,780 \times 20\% = R356$	R356	D	1
1.2.6 (b)	She gets 100% cover for 24 months or She get 100% cover for 2 years	a 100% 24 months	D	1
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Q2	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data handling P Probability	1 KN 2 RP 3 MSP 4 R&R
2.1.1 (a)	$\text{Mean} = \frac{506}{6} = 84,33$ Accept 84	divided by 5; 6 or 7 a 84,33 correct answer	D	2
2.1.1 (b)	6; 65; 96; 97; 104; 138 Median = 96,5 Accept 96 or 97	ordering data 96,5 correct answer	D	2
2.1.1 (c)	Range = 138 – 6 Range = 132	subtracting 6 from 138 132 correct answer	D	2
2.1.2	Number of Rupees = $3 \times 10\,000\,000$ Number of Rupees = 30 000 000 rupees Rand value = 30 000 000 rupees $\times 0,2$ Rand value = R6 000 000 Rand value = six million rand	Multiplying R10 000 000 by 3 30 000 000 rupees multiplying previous answer by 0,2 R6 000 000 six million rand	F	3

2.1.3 (a)



heading, axes labels and legend

Double bar graph

correct plotting

First 3 orange bars

correct plotting

Last 2 orange bars

correct plotting

First 3 blue bars

correct plotting

Last 2 blue bars

space between bars

D

2

2.1.3 (b)	$\% \text{ increase} = \frac{9,25 - 2}{2} \times 100$ $\% \text{ increase} = 362,5\%$ Wrong values used correctly One mark only	9,25 subtracting 2 dividing by 2 362,5%	F	2
2.2.1 (a)	Broken line graph or line graph	Broken line graph	D	1
2.2.1 (b)	The rand has strengthened from a high of R14,6458 to R14,4701 over the days 28–30 March	strengthened high of R14,6458 to R14,4701 28 March-30 March	D	4
2.2.1 (c)	The increases and decreases on the y-axis seem more extreme due to the y-axis not starting at zero or only starting at 14,4482 Or The graph is misleading as it goes down (decreases) but shows a strengthening of the Rand	increases and decreases on the y-axis seem more extreme. y-axis not starting at zero or starts at 14,4482 Or Graph is decreasing Shows a strengthening of the Rand.	D	4
2.2.2	Value in dollars = 20(248,17) + 50(139,14) + 30(391,82) Value in dollars = \$23 675 Value in rands = \$23 675 × 14,4701 Value in rands = R342 579,62✓car rounding two decimal places	multiply and adding three values correct answer multiplying answer by 14,4701 R342 579,62 correct rounding	F	2

Q3	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data handling P Probability	1 KN 2 RP 3 MSP 4 R&R
3.1.1	Option 1 = R700 × 24 = R16 800 Option 2 = R900 × 36 = R32 400 Option 3 = R950 × 36 = R34 200	R16 800 R32 400 × 36 R34 200	F	2
3.1.2	The number of free minutes per month. a The cost per minute for making calls. a Length of contract. a	free minutes peak call rate length of contract	F	4
3.1.3 (a)	$P(\text{MTN}) = \frac{1}{3} = 0,33 \text{ or } 33,33\%$	$\frac{1}{3}$ 0,33	P	1
3.1.3 (b)	$P(\text{Vodacom or Telkom}) = \frac{2}{3} = 0,67 \text{ or } 66,67\%$	$\frac{2}{3}$ 0,67	P	1
3.1.4 (a)	Method 1: Price excl VAT = $\frac{\text{R15 500}}{115} \times 100 = \text{R13 478,26}$ VAT = R15 500 – R13 478,26 = R2 021,74 Method 2: VAT = $\frac{\text{R15 500}}{115} \times 15 = \text{R2021,74}$	Method 1: $\frac{\text{R15 500}}{115} \times 100$ R13 478,26 R2 021,74 Method 2: $\frac{\text{R15 500}}{115}$ × 15 R2 021,74	F	2

3.1.4 (b)	Cash Price = R15 500 Cost of minutes = $R1,60 \times 25 \text{ min} \times 24 \text{ months}$ = R960 Total cost = R16 460 Cheaper to get cash option Or = $R15\,500 \div 24$ = R645,83 per month $R700 - (1,60 \times 25)$ = R660 Cheaper to get cash option = $R15\,550 \div 24$ = R645,83 per month Contract = R700 per month Cheaper to get cash option Or R16 800 = Cheaper cash	multiplying by 25 and 24 R960 Total cost for cash = R16 460 cheaper to get cash	F	4
3.1.5	(a) R700 (b) $700 + 25 \times 1,60 = R740$ (c) $(R980 - R700) \div 1,60 = 175$ Number of mins = $175 + 25 = 200$ OR $(R980 - R900) \div R0,80 = 100$ Number of mins = $100 + 100 = 200$	(a) R700 (b) substitution R740 (c) subtract R700 175 200	F	2

3.1.6	Cost graphs of three cellphone companies <table><caption>Data points from the graph</caption><thead><tr><th>Number of Minutes used per month</th><th>MTN (Rands)</th><th>Vodacom (Rands)</th><th>Telkom (Rands)</th></tr></thead><tbody><tr><td>0</td><td>950</td><td>900</td><td>700</td></tr><tr><td>10</td><td>950</td><td>900</td><td>700</td></tr><tr><td>20</td><td>950</td><td>900</td><td>700</td></tr><tr><td>30</td><td>950</td><td>900</td><td>700</td></tr><tr><td>40</td><td>950</td><td>900</td><td>730</td></tr><tr><td>50</td><td>950</td><td>900</td><td>760</td></tr><tr><td>60</td><td>950</td><td>900</td><td>790</td></tr><tr><td>70</td><td>950</td><td>900</td><td>820</td></tr><tr><td>80</td><td>950</td><td>900</td><td>850</td></tr><tr><td>90</td><td>950</td><td>900</td><td>880</td></tr><tr><td>100</td><td>950</td><td>900</td><td>910</td></tr><tr><td>110</td><td>950</td><td>920</td><td>940</td></tr><tr><td>120</td><td>950</td><td>940</td><td>970</td></tr><tr><td>130</td><td>950</td><td>960</td><td>1000</td></tr><tr><td>140</td><td>950</td><td>980</td><td>1030</td></tr><tr><td>150</td><td>950</td><td>1000</td><td>1060</td></tr><tr><td>160</td><td>950</td><td>1020</td><td>1090</td></tr><tr><td>170</td><td>950</td><td>1040</td><td>1120</td></tr><tr><td>180</td><td>950</td><td>1060</td><td>1150</td></tr><tr><td>190</td><td>950</td><td>1080</td><td>1180</td></tr><tr><td>200</td><td>950</td><td>1100</td><td>1210</td></tr></tbody></table>	Number of Minutes used per month	MTN (Rands)	Vodacom (Rands)	Telkom (Rands)	0	950	900	700	10	950	900	700	20	950	900	700	30	950	900	700	40	950	900	730	50	950	900	760	60	950	900	790	70	950	900	820	80	950	900	850	90	950	900	880	100	950	900	910	110	950	920	940	120	950	940	970	130	950	960	1000	140	950	980	1030	150	950	1000	1060	160	950	1020	1090	170	950	1040	1120	180	950	1060	1150	190	950	1080	1180	200	950	1100	1210	heading, axes labels (i) correct plotting 3.1.5 (a) (ii) correct plotting 3.1.5 (b) (iii) correct plotting 3.1.5 (c) Joining of points with ruler correct Legend	F	3
Number of Minutes used per month	MTN (Rands)	Vodacom (Rands)	Telkom (Rands)																																																																																									
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3.1.7 (a)	(180 minutes ; R950)	180 minutes R950	F	4																																																																																								
3.1.7 (b)	After 180ca minutes	fter 180	F	4																																																																																								
3.1.8	Option 1 as it will be the cheapest of the three options OR Option 1 as the graph is below the other graphs.	Option 1 cheapest of the three	F	4																																																																																								

Q4	Marking guideline	Skills assessed	Topic	Level																		
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data handling P Probability	1 KN 2 RP 3 MSP 4 R&R																		
4.1.1	Cost of electricity = $146,48 \times 500 + 169,11 \times 500 + 100 \times 182,07$ Cost of electricity = 176 002 cents Cost including fix costs = $176\,002 + 169,30 + 498,74$ Cost including fix costs = $176\,670 \div 100$ Cost including fix costs = R1 766,70	using tariff table correctly 176 002 cents adding 169,30 adding 498,74 dividing by 100 to get rands unit	F	3																		
4.1.2	1 100 units: R1766,70 1 unit: R1,61	correct values written as a rate 1 unit: R1,61 rounding	F	3																		
4.1.3	2020/2021 Price = $R1\,766,70 \div 114,59\% = R1\,541,76$	dividing by 114,59% or 1,11459 R1541,76	F	3																		
4.1.4	<table><thead><tr><th>Block name</th><th>kwh used</th><th>Tariff (cents/kwh) Including VAT</th></tr></thead><tbody><tr><td>Block one</td><td>0–500 kwh</td><td>146</td></tr><tr><td>Block two</td><td>501–1 000 kwh</td><td>(a) 169</td></tr><tr><td>Block three</td><td>(b) 1 001–2 000 kwh</td><td>182</td></tr><tr><td>Block four</td><td>2 001–3 000 kwh</td><td>192</td></tr><tr><td>Block five</td><td>(c) 3 001 or more OR ≥3 001 or >3000</td><td>(d) 202</td></tr></tbody></table>	Block name	kwh used	Tariff (cents/kwh) Including VAT	Block one	0–500 kwh	146	Block two	501–1 000 kwh	(a) 169	Block three	(b) 1 001–2 000 kwh	182	Block four	2 001–3 000 kwh	192	Block five	(c) 3 001 or more OR ≥3 001 or >3000	(d) 202	(a) 169 (b) 1 001–2 000 kwh (c) 3 001 kwh or more OR more than 3000 kwh OR greater than or equal to 3 001 kwh (d) 202	F	2
Block name	kwh used	Tariff (cents/kwh) Including VAT																				
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Block four	2 001–3 000 kwh	192																				
Block five	(c) 3 001 or more OR ≥3 001 or >3000	(d) 202																				

4.2.1	2%	2%	D	2																																																																																	
4.2.2	$P(\text{year no increase}) = \frac{4}{27}$ $P(\text{year no increase}) = 14,8$	$\frac{4}{27} \times 100$ $14,8\%$	P	4																																																																																	
4.2.3	2009 and 31%	2009 31%	D	4																																																																																	
4.2.4	After 2007 there were several sharp increases in the electricity price all having increases of over 20%	2007 Sharp increases over 20%	D	4																																																																																	
4.2.5	High inflation Vs Low increase values given <table><tr><td>Year</td><td>Inflation</td><td>Price</td></tr><tr><td>1996</td><td>7%</td><td>1%</td></tr><tr><td>1997</td><td>7%</td><td>4%</td></tr><tr><td>1998</td><td>6%</td><td>3%</td></tr><tr><td>1999</td><td>4%</td><td>1%</td></tr><tr><td>2004</td><td>1%</td><td>0%</td></tr><tr><td>2001</td><td>5%</td><td>4%</td></tr></table> Low Inflation Vs High Increase values given <table><tr><td>Year</td><td>Inflation</td><td>Price</td><td>Year</td><td>Inflation</td><td>Price</td></tr><tr><td>2000</td><td>7%</td><td>1%</td><td>2013</td><td>5%</td><td>15%</td></tr><tr><td>2003</td><td>7%</td><td>4%</td><td>2014</td><td>5%</td><td>8%</td></tr><tr><td>2005</td><td>6%</td><td>3%</td><td>2015</td><td>4%</td><td>8%</td></tr><tr><td>2006</td><td>4%</td><td>1%</td><td>2016</td><td>5%</td><td>8%</td></tr><tr><td>2008</td><td>1%</td><td>0%</td><td>2017</td><td>4%</td><td>8%</td></tr><tr><td>2009</td><td>5%</td><td>4%</td><td>2018</td><td>3%</td><td>6%</td></tr><tr><td>2010</td><td>4%</td><td>25%</td><td>2019</td><td>3%</td><td>14%</td></tr><tr><td>2011</td><td>5%</td><td>26%</td><td>2020</td><td>2%</td><td>4%</td></tr><tr><td>2012</td><td>6%</td><td>25%</td><td></td><td></td><td></td></tr></table> Therefore, Sashin is incorrect	Year	Inflation	Price	1996	7%	1%	1997	7%	4%	1998	6%	3%	1999	4%	1%	2004	1%	0%	2001	5%	4%	Year	Inflation	Price	Year	Inflation	Price	2000	7%	1%	2013	5%	15%	2003	7%	4%	2014	5%	8%	2005	6%	3%	2015	4%	8%	2006	4%	1%	2016	5%	8%	2008	1%	0%	2017	4%	8%	2009	5%	4%	2018	3%	6%	2010	4%	25%	2019	3%	14%	2011	5%	26%	2020	2%	4%	2012	6%	25%					D	4
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Q5	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data handling P Probability	1 KN 2 RP 3 MSP 4 R&R
5.1.1	Annual gross salary = $R45\,000 \times 12 = R540\,000$	multiple $R45\,000 \times 12$ $R540\,000$	F	2
5.1.2	Annual pension = $R540\,000 \times 15\% = R81\,000$ Or $R6750$	$R540\,000 \times 15\%$ $R81\,000$	F	2
5.1.3	Annual taxable salary = $R540\,000 - R81\,000$ Annual taxable salary = $R459\,000$	subtract $R81\,000$ $R459\,000$	F	1
5.1.4	Annual tax = $R73\,726 + 31\% (R459\,000 - R353\,100)$ Annual tax = $R73\,726 + R32\,829 - R16\,425$ Annual tax = $R106\,555 - R16\,425$ Annual tax = $R90\,130$	correct tax bracket subtract $R353\,100$ correct $R32\,829$ correct $R106\,555$ $R16\,425$ $R90\,130$	F	3
5.2	Tax = $R91\,250 \times 18\%$ -Rebate Tax = $R16\,425 - R16\,425$ Tax = R0 OR Tax Threshold = $R16\,425 \div 18\%$ Tax Threshold = $R91\,250$ OR $R91250 + R16425$ $= R107\,675$ $R107\,675 \div 118\%$ $= R91\,250$	Multiple by 18% $R16\,425$ Tax = R0 after rebate OR Use correct rebate divide by 18% $R91\,250$	F	4

Total: 150 marks