basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2015

MEMORANDUM

MARKS: 150

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RD	Reading from a table/graph/diagram/map
SF	Correct substitution in a formula
O	Opinion/Example Reason / Explanation /Deduction /Comment / Interpretation
P	Penalty, e.g. for no units, incorrect rounding off, etc.
R	Rounding off/Reasoning
NP	No penalty for rounding off/units

This memorandum consists of 20pages.

QUESTION 1 [34 MARKS]

Ques	Solution	Explanation	Level
1.1.1	Gross monthly salary of one driver ✓A ✓MA = R734,53×52÷12 = R3 182,96 **OR** Weekly salary of one driver ✓A ✓MA = R3 182,96 × 12 ÷ 52 = R734,53	1A using the correct value 1MA dividing by 12 and multiplying by 52 **OR** 1A using the correct value 1MA dividing by 52 and multiplying by 12 (2)	L2
1.1.2	✓M Salary of one cleaner = 8 × 20 × R18,66 = R2 985,60 ✓CA ✓CA Salary of one supervisor = R2 985,60 + R230,00 = R3 215,60 **Salaries:** Handymen = 11 × R4 410,37 = R48 514,07 ✓A Cleaners = 272 × R2 985,60 = R812 083,20 ✓CA Supervisors = 12 × R3 215,60 = R38 587,20 ✓CA Drivers = 11 × R3 182,96 = R35 012,56 ✓CA Total salaries = R48 514,07 + R812 083,20 + R38 587,20 + R 35 012,56 = R934 197,03 ✓CA ✓A Total UIF payable = 2% × R934 197,03 = R18 683,94 ✓CA **OR**	1M multiplying hours, days and rate 1CA salary of 1 cleaner 1CA salary of 1 supervisor 1A salaries Handymen 1CA salaries Cleaners 1CA salaries supervisors 1CA salaries drivers 1CA Total salaries 1A 2% contribution 1CA total contribution **OR**	L3

Ques	Solution	Explanation	Level

	$\checkmark$MA
	Salary of one cleaner $= 8 \times 20 \times R18,66$
	
	    $= R2\ 985,60$ $\checkmark$CA
	
	Salary of one supervisor $= R2\ 985,60 + R230,00$
	
	    $= R3\ 215,60$ $\checkmark$CA
	Total UIF payable: $\checkmark$A
	For 11 handymen$= 11 \times R4\ 410,37 \times 2\% = R970,28$ $\checkmark$A
	
	    $\checkmark$CA
	For 272 cleaners$= 272 \times R2\ 985,60 \times 2\% = R16\ 241,66$
	
	For 12 supervisors $= 12 \times R3\ 215,60 \times 2\%= R771,74$ $\checkmark$CA
	
	For 11 drivers$= R35\ 012,56 \times 2\%= R700,25$ $\checkmark$CA
	
	Total UIF payable
	$= R970,28+ R16\ 241,66 + R771,74+ R700,25$ $\checkmark$CA
	$= R18\ 683,93$ $\checkmark$CA
	
	OR
	
	Total monthly salary
	
	    $\checkmark$MA $\checkmark$M $\checkmark$A
	$= 11 \times R4\ 410,37 + 272 \times 8 \times 20 \times R18,66$
	
	$+ 12 \times (8 \times 20 \times R18,66 + R230,00) + 11 \times R3\ 182,96$
	    $\checkmark$A $\checkmark$CA $\checkmark$CA $\checkmark$CA
	$= R48\ 514,07 + R812\ 083,20 + R38\ 587,20 + R35\ 012,56$
	
	$= R934\ 197,03$ $\checkmark$CA
	
	    $\checkmark$A
	Total UIF payable $= 2\% \times R934\ 197,03$
	$= R18\ 683,94$ $\checkmark$CA
		1MA multiplying hours, days and rate
		1CA salary of 1 cleaner
		
		1CA salary of 1 supervisor
		
		1A 2% contribution
		1A UIF handymen
		1CA UIF cleaners
		
		1CA UIF supervisors
		1CA UIF drivers
		
		1CA adding
		1CA total contribution
		
		OR
		
		1MA adding
		1A multiplying numbers
		1M multiplying hours, days and rate
		1A salary of handymen
		1CA salary of cleaners
		1CA salary supervisors
		1CA salary drivers
		1CA total salary
		
		1A 2% contribution
		1CA total contribution
		
		NP – rounding
		
		(10)	

Ques	Solution	Explanation	Level
1.1.3	Mean salary $= \dfrac{R934\ 197{,}03}{306}$ ✓MA $= R3\ 052{,}93$ ✓CA % difference = $\dfrac{\text{Mean salary} - \text{cleaner's salary}}{\text{cleaner's salary}} \times 100\%$ ✓M $= \dfrac{R3\ 052{,}93 - R2\ 985{,}60}{R2\ 985{,}60} \times 100\%$ ✓CA $= 2{,}255158092\%$ $\approx 2{,}3\%$ ✓CA The statement is **VALID**. ✓O **OR** Mean salary $= \dfrac{R934\ 197{,}03}{306}$ ✓MA $= R3\ 052{,}93$ ✓CA Mean as a percentage of the lowest salary $\dfrac{R3\ 052{,}93}{R2\ 985{,}60} \times 100\% = 102{,}255...\%$ ✓M % difference $= 102{,}255...\% - 100\%$ ✓M $\approx 2{,}3\%$ ✓CA The statement is **VALID** ✓O **OR** Mean UIF payable $= \dfrac{R18\ 683{,}93}{306}$ ✓MA $=$ ✓CA $61{,}05859...$ % difference $= \dfrac{\text{Mean UIF} - \text{Cleaners UIF}}{\text{Cleaners UIF}} \times 100\%$ ✓M ✓M $= \dfrac{61{,}05859.... - 59{,}711985...}{59{,}711985...} \times 100\%$ $= 2{,}255…\%$ $\approx 2{,}3\%$ ✓CA The statement is **VALID**. ✓O **OR**	1MA dividing total salary from Q1.1.2 by number of employees 1CA simplification 1M difference 1CA percentage calculation 1CA percentage 1O conclusion **OR** 1MA dividing total salary from Q1.1.2 by number of employees 1CA simplification 1M percentage 1M subtracting 100% 1CA percentage 1O conclusion **OR** 1MA dividing total UIF from Q1.1.2 by number of employees 1CA simplification 1M subtracting 1M percentage 1CA simplification 1O conclusion **OR**	L4

Ques	Solution	Explanation	Level
1.1.3	Mean salary $= \dfrac{R934\ 197,03}{306}$ ✓MA $=\ R3\ 052,93$ ✓CA % difference = $\dfrac{\text{Mean salary} - \text{cleaner's salary}}{\text{mean salary}} \times 100\%$ ✓M $= \dfrac{R3\ 052,93 - R2\ 985,60}{R3\ 052,93} \times 100\%$ ✓CA $= 2,2054….\%$ $\approx 2,2\%$ ✓CA The statement is **VALID**. ✓O **OR** Mean salary $=\dfrac{R934\ 197,03}{306}$ ✓MA $=\ R3\ 052,93$ ✓CA Lowest salary as a percentage of the mean $\dfrac{R2\ 985,60}{R3\ 052,93} \times 100\% = 97,7945...\%$ ✓M % difference $= 100\% - 97,7945\%$ ✓M $\approx 2,2\%$ ✓CA The statement is **VALID.** ✓O **OR** Mean UIF payable $=\dfrac{R18\ 683,93}{306}$ ✓MA $=$ ✓CA $61,05859...$ % difference $=\dfrac{\text{Mean UIF} - \text{Cleaners UIF}}{\text{Mean UIF}} \times 100\%$ $=\dfrac{61,05859.... - 59,711985...}{61,05859...} \times$ ✓M ✓M 100% $= 2,2054…\%$ $\approx 2,2 \%$ ✓CA The statement is **VALID.** ✓O	1MA dividing total salary from Q1.1.2 by number of employees 1CA simplification 1M difference 1CA percentage calculation 1CA percentage 1O conclusion **OR** 1MA dividing total salary from Q1.1.2 by number of employees 1CA simplification 1M percentage 1M subtracting from 100% 1CA percentage 1O conclusion **OR** 1MA dividing total UIF from Q1.1.2 by number of employees 1CA simplification 1M subtracting 1M percentage 1CA simplification 1O conclusion (6)	L4

1.2.1	Number of additional employees is $11 + 12 + 272 + 11 = 306$ $\checkmark$A Number of female cleaners $= \dfrac{3}{4} \times 272$ $= 204$ $\checkmark$A Probability of selecting a female cleaner $= \dfrac{204}{306}$ $\checkmark$CA $= 0,66666..$ $\approx 0,667$ $\checkmark$R	1A addition 1A proportion 1CA probability 1R rounding correctly **Answer only full marks** (4)	L2
1.2.2	Most unlikely, because the male supervisors are the smallest number of additional employees. $\checkmark\checkmark$O **OR** The fraction for the male supervisors is smaller $\left(\dfrac{3}{306} = 0,0098039 \right)$ $\checkmark\checkmark$O	2O explanation (2)	L2
1.3.1	$A= \dfrac{R964,87}{R2\ 000} \times 100\%$ $\checkmark$RT $\checkmark$M $= 48,24\ \%$ $\checkmark$A $B = \dfrac{R2\ 065,49}{41,31\%}$ $\checkmark$M $= R4\ 999,98$ $\checkmark$A **OR** Last income $\times 41,31\% = R2\ 065,49$ $\checkmark$M $\therefore\ B = R2\ 065,49 \div 41,31\%$ $= R4\ 999,98$ $\checkmark$A	1RT reading from table 1M finding % 1A value of A 1M dividing 1A value of B **OR** 1M dividing 1A value of B Accept R5 000 **NP - rounding** **Answer only full marks** (5)	L2

Ques	Solution Explanation	Level
1.3.2	**THE RELATIONSHIP BETWEEN THE GROSS MONTHLY INCOME AND THE INCOME REPLACEMENT RATE (IRR)** 1A for first 3 points plotted correctly 1CA for plotting points A and B 1A for plotting last 3 points 1CA joining the points up to R8 099 with a curve 1CA the line from R8 099 to R10 000 (5)	L2
		[34]

QUESTION 2 [30 MARKS]			
Ques	**Solution**	**Explanation**	**Level**
2.1.1	$$P_{(\text{weight loss more than 20kg})} = \frac{\checkmark A \atop 8}{12 \,\checkmark A} \times 100\% \;\checkmark A$$ $\approx 66{,}67\%$ $\checkmark$CA	1A numerator 1A denominator 1CA probability as % **NP - rounding** **Answer only full marks** (3)	L2

2.1.2	102 pounds = $102 \times 0{,}453592 \approx 46{,}27$ kg
	55 pounds = $55 \times 0{,}453592 \approx 24{,}95$ kg $\checkmark\checkmark$C
	36 pounds = $36 \times 0{,}453592 \approx 16{,}33$ kg
	
	Arranged weight loss for males:
	                     $\checkmark$ CA
	13,2 ; 13,2 ; 16,33 ; 16,7 ; 18,8 ; **23,7** ;
	24,95 ; 25,6 ; 31,6 ; 37,65 ; 43,36 ; 46,27.
	                         $\checkmark$CA
	Median weight loss of males $= \dfrac{23{,}70 + 24{,}95}{2}$ $\checkmark$M
	
	                = 24,325
	                     $\checkmark$CA
	$\approx 24{,}33$kg
	
	Her statement is NOT correct. $\checkmark$O
		1C converting one
		1C converting other two
		
		1CA arranging weights
		
		1CA identifying middle values
		1M median concept
		
		1CA simplification
		
		1O conclusion
		
		Max 4 marks if using SA males only
		
		Max 3 marks if conversions are omitted
		
		(7)
			L4

2.1.3	$\checkmark$M IQR for males (in kg) = $34{,}63 - 16{,}52 = 18{,}11$ $\checkmark$A IQR for females (in kg) = $64{,}87 - 27{,}97 = 36{,}9$ $\checkmark$A The female IQR is more than the male IQR. $\checkmark\checkmark$R	1M IQR concept 1A males IQR 1A females IQR 2R comment relating to the IQR values (5)	L2 L4

Ques	Solution	Explanation	
2.2.1	**Working with 365days**: Mass in one can is $8,75 \times 4g = 35g$ ✓MA Mass for a year is $=35g \times 365$ ✓MA $= 12\ 775g$ ✓CA For 2 cans $= 2 \times 12\ 775g$ $= 25\ 550g$ ✓CA **OR** Mass in one can $= 8,75 \times 4$ g $= 35$ g ✓MA Mass in TWO cans $= 35g \times 2 = 70$ g ✓MA Mass for a year $= 70$ g $\times 365$ ✓M $= 25\ 550$ g ✓CA **OR** In 1can → 8,75 teaspoons 2 cans → 17,5 teaspoons ✓A Mass per day $= 17,5 \times 4 = 70$ g ✓MA ✓M Mass for the year $= 70$ g $\times 365 = 25\ 550$ g ✓CA **OR** **Working with 366 days:** Mass in one can : $8,75 \times 4$ g $= 35g$ ✓MA Mass of sugar for 1 can for one year ✓M ✓CA $= 35g \times 366 = 12810g$ Mass of sugar in 2 cans for one year ✓CA $= 2 \times 12\ 810g = 25\ 620g$	1MA mass in 1 can 1MA multiply by 365 1CA simplification 1CA annual mass intake **OR** 1MA mass in 1 can 1MA mass for 2 cans 1M multiply by 365 1CA simplification **OR** 1A number of teaspoons 1MA mass per day 1M multiplying by 365 1CA simplification **OR** 1MA mass of sugar in 1 can 1M multiply by 366 1CA simplification 1CA mass for two cans (4)	L3

Ques	Solution	Explanation	
2.2.2	Calories before = $124 \times 2 + 116 + 168$ = 532 calories ✓A ✓M Calories after changing $= \left(\dfrac{500 \times 52}{240}\right) \times 2 + 32 + 0$ ✓M = 248,67 calories ✓CA Difference = 532 calories – 248,673 calories = 283,33 calories ✓CA	1A calculating calories 1M ratio 1M addition 1CA calculating calories 1CA difference **NP - rounding**	L3
		(5)	
2.2.3	**Sugar intake before diet:** $= 7,75 \times 2 + 7,25 + 10,5$ ✓MA = 33,25 tsp. OR 133grams ✓CA **Sugar intake after diet:** $= 2 \times \left(\dfrac{500 \times 3,25}{240}\right) + 2 + 0$ ✓A $= 2 \times 6,77 + 2 + 0,00$ = 15,54 tsp. OR 62,16 grams ✓CA % Reduction of sugar	1MA adding correct values 1CA simplification 1A sugar in vitamin water 1CA simplification	L4

Continuing 2.2.3:

(using teaspoons)		(usings grams)
$=\dfrac{15,54}{33,25} \times 100\%$ $\approx 46,74\%$ ✓MA	**OR**	$=\dfrac{62,16}{133} \times 100\%$ $\approx 46,74\%$ ✓MA

NOT VALID ✓O

1MA percentage

1O opinion
Accept VALID as opinion only if an explanation provided

                 OR

Using Calories from Q 2.2.2
      ✓M ✓CA   ✓M
% Calories $= \dfrac{248,67}{532}\times100\% = 46,7\%$ ✓CA
              ✓A

NOT VALID ✓O

OR
1CA total calories after
1M percentage
1M multiply by 100
1 CA simplification
1A total calories before
1O opinion

(6)

[30]

QUESTION 3 [31 MARKS]

Ques	Solution	Explanation	
3.1	✓✓O For easy access **OR** to save on costs **OR** no privacy required **OR** aesthetic value **OR** ease of movement between rooms **OR** ventilation purposes	2O explanation (2)	L4
3.2	✓A Living room, bathroom and bedroom 2. ✓✓O No direct sunlight into the room. **OR** The sun's position is on the northern side of the house. ✓✓O (3)	1A identified at least two rooms 2O reason	L2 L4

3.3.1	The living room floor side **OR** ✓MA
	                                  $100\% - 7{,}04\% = 92{,}96\%$
	     ✓MA ✓C ✓M Side ✓C ✓M
	$= 3{,}550\text{ m} - (3{,}550\text{ m} \times 7{,}04\%)$ $= 3{,}550\text{ m} \times 92{,}96\%$
	$= 3{,}3008\text{ m}$ $= 3{,}3008\text{ m}$
	$\approx 3{,}3\text{m}$
	$\therefore\ 3{,}3\text{ m} \times 3{,}3\text{ m}$ $\therefore\ 3{,}3\text{ m} \times 3{,}3\text{ m}$
		1C conversion
		1MA for subtracting
		1M multiplication
		
		(3)
			L2

3.3.2	**Area of 4 walls** ✓SF $= 4 \times (3{,}3\text{ m} \times 2{,}650\text{ m})$ $= 34{,}98\text{ m}^2$ ✓CA **Area of 2 door openings** **Area of opening to passage** $= 2 \times \text{length} \times \text{width}$ $= \text{length} \times \text{width}$ $= 2 \times 2{,}032\text{ m} \times 0{,}750\text{ m}$✓M $= 2{,}082\text{ m} \times 0{,}75\text{ m}$ ✓M $= 3{,}048\text{ m}^2$ ✓CA $= 1{,}5615\text{ m}^2$ ✓CA **Area of window** $= 1{,}511\text{ m} \times 0{,}949\text{ m}$✓M $= 1{,}434\text{ m}^2$ ✓CA **Area to cover with panelling** $= (34{,}98 - 3{,}048 - 1{,}5615 - 1{,}434)\text{ m}^2$ ✓M $= 28{,}9365\text{ m}^2$ ✓CA $\approx 29\text{ m}^2$ ✓R **OR**	1SF area wall dimensions 1CA area of 4 walls 2M door opening dimensions 1CA area of opening to passage 1CA 2 door openings 1M window dimensions 1CA area of window 1M subtracting 1CA area 1R rounding **OR**	L3

Ques	Solution	Explanation	
	Area of northern wall = Area of wall – area of door ✓M = (3,3 m × 2,650 m) – (2,082 m × 0,750 m) = 8,745 m² – 1,5615 m² = 7,1835 m² ✓CA **Area of eastern wall** = Area of wall – area of door ✓M = (3,3 m × 2,650 m) – (2,032 m × 0,750 m) = 8,745 m² – 1,524 m² = 7,221 m² ✓CA **Area of southern wall** = Area of wall – area of door – area of window ✓M ✓A = (3,3 m × 2,650 m) – (2,032 m × 0,750 m) – (1,511 m × 0,949 m) = 8,745 m² – 1,524 m² – 1,434 m² = 5,787 m² ✓CA **Area of western wall** = (3,3 m × 2,650 m) = 8,745 m² ✓CA **Area to cover** ✓M = 7,1835 m² + 7,221 m² + 5,787 m² + 8,745 m² = 28,9365 m² ✓CA ≈ 29 m² ✓R **OR** **Area of wall including door and window openings** = perimeter of floor × height = 2 × (width + width) × height = 2 × (3,3 m + 3,3 m) × 2,650 m ✓M = 34,98 m² ✓CA **Area of window 1 opening** = length × breadth ✓M = 1,511 m × 0,949 m =1,433939 m² ✓CA **Area of 2 door openings** **Area of opening to passage** = 2 × length × width = length × width = 2 × 2,032 m × 0,750 m ✓M = 2,082 m× 0,75 m ✓M = 3,048 m² ✓CA 1,5615 m² ✓CA **Area to cover** ✓M = 34,98 m² – 1,433939 m² – 3,048 m² – 1,5615 m² = 28,936561 m² ✓CA ≈ 29 m² ✓R	1M subtracting areas 1CA for calculating area of northern wall 1M subtracting areas 1CA for calculating area of eastern wall 1M subtracting areas 1A subtracting 1CA for calculating area of southern wall 1CA for calculating area of western wall 1M for adding 4 walls 1CA simplification 1R rounding **OR** 1M multiplying 1CA calculating total area of walls 1M area formula 1CA calculating area of window 2M area formula 2CA calculating area of door openings 1M for subtracting 1CA simplification 1R for rounding (11)	

Ques	Solution	Explanation	
3.4	Surface area of one panel = 2 m × 0,15 m = 0,3 m² ✓A	1A area	L4
	Number of panels needed $=\dfrac{29 \text{ m}^2}{0,3 \text{ m}^2}$ = 96,666...≈ 97 ✓CA	1CA from Q3.3.2 simplification	
	Total panels needed to be purchased = 97× 104,5% **OR** 97 × 4,5% = 4,365 = 101,365 ✓CA ≈ 5 ≈ 102 97 + 5 = 102 ✓CA	1CA number of panels 1R rounding	
	✓R ✓C Volume of 102 panels = 102× 0,0125m× 0,3 m² ✓SF = 0,3825 m³ ✓CA	1C convert to metre 1SF finding volume 1CA volume in m³	
	Cost of panels excluding **OR** Price of wood including VAT VAT = 0,3825 × R5 000,00 = R5 000 per m³ × 114% = R1 912,50 ✓CA = R5 700 per m³ ✓CA Cost of the panels Cost of the panels including including VAT VAT = 1,14 × R1 912,50 = R5 700 × 0,3825 = R2 180,25 ✓CA = R2 180,25 ✓CA	1CA cost excluding VAT 1CA cost incl. VAT	
	Labour cost = 29 × R125,00 = R3625,00 ✓CA	1CA labour cost (CA area from 3.3.2)	
	Total cost = R2 180,25 + R3 625,00 = R5805,25 ✓CA	1CA total cost	
	Budget is **ENOUGH** ✓O	1O conclusion	
	OR	**OR**	

Ques	Solution	Explanation	
	Surface area of wood $= 29 \text{ m}^2$ ✓CA Volume of wood $= 29\text{m}^2$ ✓M $\times$ 0,0125 m ✓A $= 0,3625 \text{ m}^3$ ✓CA Total volume of wood $= 0,3625 \times 104,5\%$ ✓M $= 0,3788125 \text{ m}^3$ ✓CA $= 0,38 \text{ m}^3$ ✓CA Cost of panels excluding **OR** Price of wood including VAT VAT $= 0,38 \times \text{R5 000,00}$ $= \text{R5 000 per m}^3 \times 114\%$ $= \text{R1 900,00}$ ✓CA $= \text{R5 700 per m}^3$ ✓CA Cost of the panels Cost of the panels including including VAT VAT $= 1,14 \times \text{R1 900,00}$ $= \text{R5 700} \times 0,38$ $= \text{R2 166,00}$ ✓CA $= \text{R2 166,00}$ ✓CA Labour cost $= 29 \times \text{R125,00}$ $= \text{R3625,00}$ ✓CA Total cost $= \text{R2 166,00} + \text{R3 625,00}$ $= \text{R5 791,00}$ ✓CA Budget is **ENOUGH** ✓O	1CA from 3.3.2 1 M calculating volume 1A correct thickness 1CA simplification 1M % increase 1CA simplification 1CA rounding 1CA cost excluding VAT 1CA cost incl. VAT 1CA labour cost (CA area from 3.3.2) 1CA total cost 1O conclusion | **NP - rounding** | (12)	
			[31]

QUESTION 4 [31 MARKS]

Ques	Solution	Explanation	
4.1.1	- Course modules have different costs ✓✓O **OR** - Course levels makes a difference. ✓✓O	2O relevant reason **OR** 2O relevant reason (2)	L4
4.1.2	**Single rooms:** ✓✓O - Have more privacy and is more convenient; no disturbance. **OR** - Better facilities. ✓✓O **OR** ✓✓O **Double rooms:** - Are not private and not convenient. ✓✓O **OR** - Students share costs ✓✓O	2O relevant reason (2)	L4
4.1.3	**Total fees for first year** = Tuition fees + hostel fees + non-SA citizen fee ✓A = R28 470 + R18 928 + R2 000 ✓M = R49 398 ✓CA	1A all the values 1M adding fees 1CA total **No penalty if deposit added** (3)	L2

4.1.4	**Minimum payment on registration:**
	
	Cost = appl. fee + 30% of tuition + non-SA additional + accommodation dep. + monthly residence fee
	
	    ✓A ✓M
	= R0,00 + 30% × R28 470 + R2000 + R1 220,00 + $\dfrac{R\,18\,928,00}{11}$
	  ✓S ✓S
	= R8 541 + R2 000 + R1 220 + R1 720,73
	
	= R13 481,73 ✓CA
		1A using correct amounts
		1M adding amounts
		1S tuition fee
		1S accommodation fee
		1CA minimum payment
		
		No penalty if deposit subtracted
		(5)
			L3

Ques	Solution	Explanation	
4.2	Afrikaans Home Language is excluded because it is the lowest: LO APS $= \dfrac{92}{2}$ ✓MA $= 46\%$ rounded up to 50% ✓R ⇨ LO will be allocated 4 APS ✓A Total APS based on final results: $= 6 + 5 + 4 + 6 + 7 + 7 + 7$ ✓CA $= 42$ ✓CA ✓CA She qualifies for **50% bursary.**	1MA calculating % of LO 1R rounding up 1A LO APS 1CA adding scores 1CA total 1CA identifying bursary % (6)	L3
4.3.1	Distance from Okahandja to Johannesburg = Windhoek to Pretoria + Okahandja to Windhoek + Pretoria to Johannesburg + 2 ×Gabarone ✓MA ✓MA $= (1\,386 + 68 + 58 + 2\times 45)$ km $= 1\,602$km ✓CA Driving time $= \dfrac{\text{Total distance}}{\text{Average speed}}$ $= \dfrac{1\,602\ \text{km}}{108\ \text{km/h}}$ ✓SF $= 14{,}8333$ hrs **OR** ≈ 14 hours 50minutes ✓CA **OR** Distance from Okahandja to Johannesburg ✓MA ✓MA $= [68 + 1107 + 2(45) + 279 + 58]$km $= 1\,602$ km ✓CA Driving time $= \dfrac{\text{Total distance}}{\text{Average speed}}$ $= \dfrac{1\,602\ \text{km}}{108\ \text{km/h}}$ ✓SF ✓CA $= 14{,}8333$ hrs **OR** ≈ 14 hours 50 minutes	1MA adding extra kilometres 1MA return on Gabarone 1CA total distance 1SF substitution 1CA Total time **OR** 2MA for adding the distances to travel 1CA total distance 1SFsubstitution 1CA total time (5)	L2

Ques	Solution	Explanation	
4.3.2	Strip charts are not drawn to scale. ✓✓O	2O for any valid explanation (2)	L4
4.3.3	Total cost = P680 × 3 + P50 + P50 + P20 ✓A = P2 160 ✓CA ∴2 160BWP = 2 160 × 1,2454ZAR ✓M = 2 690,064ZAR ✓CA ∴2 690,064ZAR = $\frac{2\,690,064}{0,998}$ NAD =2 695,45491NAD ✓CA ≈ 2 695,45NAD Her estimation is **NOT VALID.** ✓O **OR** NAD 2160 = 2 160 × 0,998 Rand ✓M = R2 155,68 ✓CA ✓A Total cost in Pula = 680 × 3 + 50 + 50 + 20 = P2 160 ✓CA Total cost in Rand = 2 160 × 1,2454 = 2 690,06 ✓CA Her estimation is **NOT VALID.**✓O	1A adding values 1CA total 1M converting P to R 1CA amount 1CA amount 1O conclusion **OR** 1M converting NAD to Rand 1CA amount in Rand 1A adding values 1CA total 1CA cost amount 1O conclusion &boxed;**NP - rounding**&boxed; (6)	L4
		[31]	

QUESTION 5 [24 MARKS]

Ques	Solution	Explanation	
5.1.1	✓✓J More Chinese migrate to other countries.	2J interpretation (2)	L4

5.1.2	**China's projected population**
	                    ✓MA
	1 356 million × 0,44% = 5,9664 million
	1 356 million + 5,9664 million = 1 361,966 4 million ✓A
	
	USA's projected population
	                    ✓MA
	319 million × 0,77% = 2,4563 million
	319 million + 2,4563 million = 321,4563 million✓A
	
	Difference = 1 361,966 4 million – 321,4563 million
	            = 1 040,5101 million✓CA
	
	OR
	China's projected population
	            ✓MA ✓A
	= 1 356 million× 1,0044% = 1 361 966 400
	
	USA's projected population
	                    ✓MA
	= 319 million× 1,0077% = 321 456 300 ✓A
	
	Difference = 1 040 510 100✓CA
		1MA calc. projected population growth
		1A population in millions
		1MA calc. projected population growth
		1A USA population in million
		1CA the difference
		
		(Accept 1041 million)
		
		OR
		1MA calc. projected population
		1A population in millions
		1MA calc. projected population
		1A USA population in million
		1CA the difference
		
		Max of 4 if rounded
		Max of 3 if millions omitted
		
		(5)
			L3

5.2.1	Middle East ✓✓RD	2RD region (2)	L2

Ques	Solution	Explanation	
5.2.2	North America's difference ≈1 010 million tons –410 million tons = 600 million tons ✓CA Asia's difference≈ 1 080 million tons – 380 million tons = 700 million tons ✓CA Asia has a higher difference of crude oil than North America ✓J **OR** Asia consumes much more crude oil than North America.	1CA for calculating North American difference [Accept values in range of ±10 million tons.] 1CA for calculating Asia's difference 1J comment **Penalise with one mark if millions omitted** (3)	L2 L4
5.2.3	They both have vibrant economies, therefore these regions need a lot more energy. ✓✓O **OR** Both regions have more industries. ✓✓O **OR** The regions have large populations. ✓✓O **OR** They use large volumes of oil because they have outdated ✓✓O technology. **OR** First world regions ✓✓O **OR** ✓✓O Developed regions	2O reason (2)	L4
5.3.1	✓M Distance in km = 33 mm ÷ 25 mm × 5 000 km = 6 600 km ✓CA Distance in miles = 6 600 km ÷ 1,609344 = 4 101,049869 miles ✓CA ≈ 4 101,05 miles **Accept measured distance from 27 to 29 mm and bar scale from 22 to 24 mm**	1M for using the line scale 1CA for calculating distance 1CA for distance in miles (3)	L3

Ques	Solution	Explanation	
			L2
5.3.2	Total amount of oil transported daily $$= 15 \text{ million barrels} \times \frac{100\%}{30\%} \quad ✓\text{MA}$$ ✓RD (above) ✓CA $= 50$ million barrels per day **OR** 30 % ~ 15 million barrels 30 % ~ 15 million barrels ✓RD 30 % ~ 15 million barrels ✓M 10 % ~ $\frac{15}{3}$ million barrels $= 5$ million barrels Therefore 100 % ~ (15 + 15 + 15 + 5) million barrels $= 50$ million barrels ✓CA	1RD reading 15 million barrels 1MA dividing by 30% 1CA simplification **OR** 1RD reading 15 million barrels 1M calculating 10% 1CA simplification **No penalty if millions omitted** (3)	
			L4
5.3.3	It is not the shortest route ✓✓O **OR** It will take longer to transport the oil ✓✓O . **OR** It will cost more to transport the oil. ✓✓O	2O relevant (time or distance related reason 2O relevant cost related reason (4)	
		[24]	
		TOTAL:150	