KWAZULU-NATAL PROVINCE

EDUCATION

REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY

COMMON TEST

APRIL 2021

MARKS: 100

TIME: 2 hours

This question paper consists of 11 pages, an Addendum with 1 Annexure and 1 Answer Sheet.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of **FOUR** questions. Answer **ALL** the questions.
2. The question paper consists of one ANNEXURE and one ANSWER SHEET.
   - 2.1 Use the **ANNEXURE** for QUESTION 2.1.
   - 2.2 Use the **ANSWER SHEET** for QUESTIONS 2.2.2 and 2.2.3.
   - 2.3 Write your surname and name in the spaces provided on the ANSWER SHEET. and hand in the ANSWER SHEET with your ANSWER BOOK.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Start EACH question on a NEW page.
5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
6. Show ALL calculations clearly.
7. Round off ALL final answers approximately according to the given context, unless stated otherwise.
8. Indicate units of measurement, where applicable.
9. Write neatly and legibly.

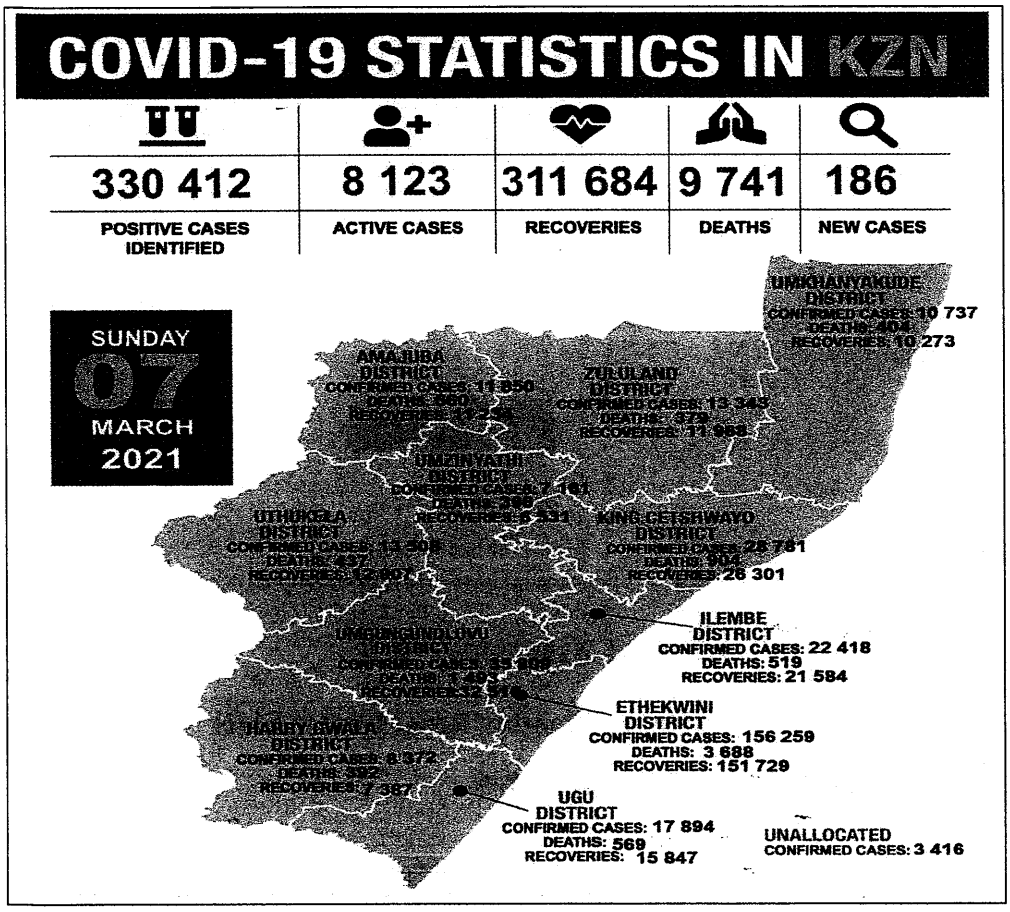
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QUESTION 1

1.1

KZN Covid 19 statistics for 07 March 2021 are shown in the picture below.

KZN COVID 19 STATS – 07 MARCH 2021



[Source :www.facebook.com/pg/kznhealth/posts/]

Use the given information above to answer the questions that follow.

1.1.1 Is the data above numerical or categorical? (2)

1.1.2 Arrange the number of deaths in the province in ascending order. (2)

1.1.3 How many districts are shown in the picture above? (2)

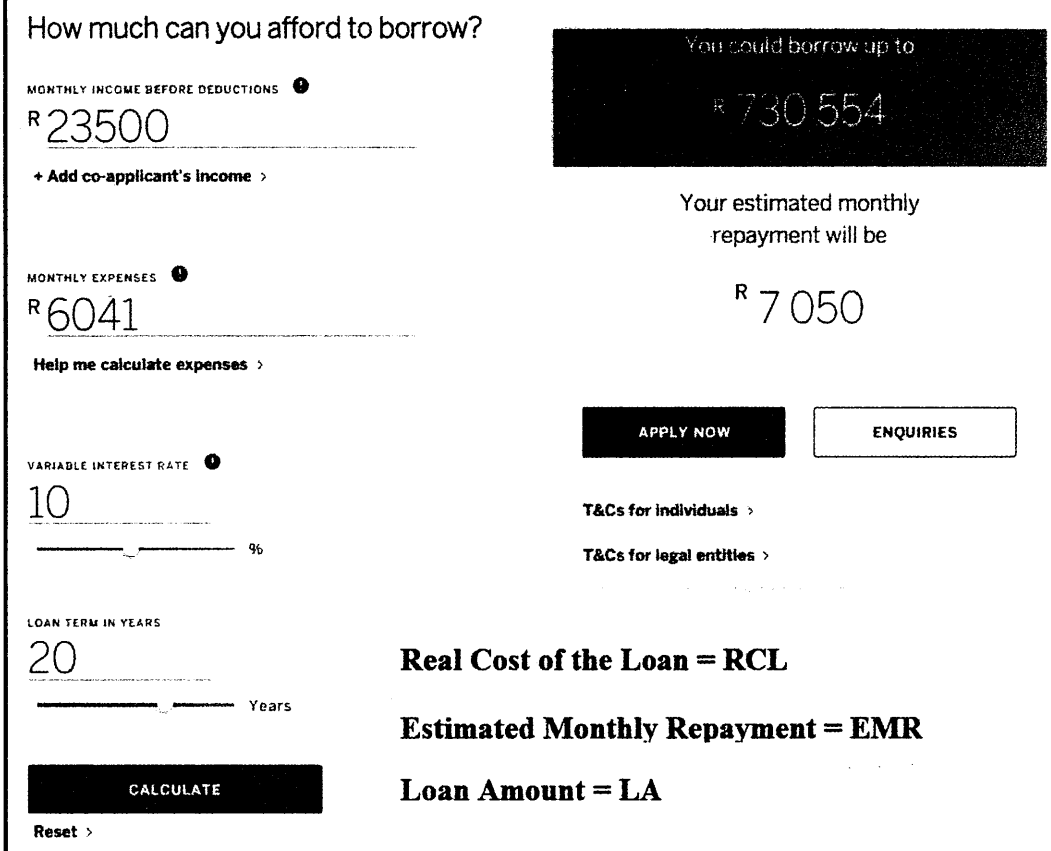
1.1.4 Which district has biggest number of confirmed cases? Write down the name of the district and the number of its confirmed cases. (2)

1.1.5 What was the minimum number of recorded recoveries in the province on the 7th of March 2021? (2)

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1.2

Trevin wants to buy a house. He got onto the internet and used Standard Bank home loan calculator to check the loan he qualifies for. Given below is an extract from the home loan calculator.



[Source: www.standardbank.co.za]

Use the information above to answer the following questions.

1.2.1 Convert the loan term to months. (2)

1.2.2 Calculate what the real cost of the loan (RCL) will be.
You may use the formula: **RCL = EMR × Loan term in months.** (2)

1.2.3 What is the total interest that will be charged on the loan amount (LA) of R730 554?
You may use the formula: **Total interest = RCL – LA.** (2)

1.2.4 Calculate the monthly interest on the loan. (2)

1.2.5 How much of the estimated monthly repayment goes towards servicing the principal on the loan amount of R730 554? (2)

[20]

QUESTION 2

2.1

Mr N. Biyela's electricity statement for 18 January 2021 to 15 February 2021 is shown on the ANNEXURE A.

Carefully study the statement in the ANNEXURE A and answer the following questions.

2.1.1 Calculate the electricity consumption (**A**). (2)

2.1.2 Use your answer from **2.1.1** and the given rate per kWh to calculate the current month's charges (**B**) in rand, excluding 15% VAT. (3)

2.1.3 Calculate the total current month's charges (**C**).
You may use the formula: **Total = B – Sub total + VAT** (2)

2.2

Mr Eric owns a barbershop and employs two barbers, each earning R5 500 per month. Other monthly fixed costs amount to R8 200 per month. On average, each barber does 20 haircuts per day and they work from Monday to Friday. A hair cut costs R50,00.

Use the given information above to answer the questions that follow.

2.2.1 Calculate the total monthly fixed cost for Mr Eric's shop. (2)

2.2.2 Complete the total income values on the provided ANSWER SHEET. (3)

2.2.3 The line graph for monthly fixed costs is drawn on the provided ANSWER SHEET. Draw the line graph for Total Income on the same answer sheet and mark the break-even point on your graph with **P**. (3)

2.2.4 Mr Eric claims that if each barber does at least 20 haircuts a day, the total profit per month will exceed R12 500. Use calculations to verify his claim.
You may use the formula: **Profit = Total Income – Total Cost.** (5)

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2.3

Maranatha Metal Polishing Company is based in Durban. Given below is the company's income and expenditure statement for December 2020.

INCOME (R)			EXPENDITURE (R)	
National Products (Local)	1 984 609		Salaries	1 362 912
International Products (Exports)	3 055 713		Overtime	187 427
			Fuel	191 102
			Repairs & Services	115 346
			Office Supplies	1 891
			Cleaning Materials	5 007
			Water & Electricity	18 238
			Rent	47 311
TOTAL:	**5 040 322**		**TOTAL:**	**1 929 234**

Use the income and expenditure statement above to answer the following questions.

2.3.1 What percentage of total income is total expenditure? (3)

2.3.2 Due to Covid-19, the export earnings for the company fell by 75% in January 2021 and local earnings decreased by 47%.

Calculate the profit/loss for the company in January 2021. (7)

[30]

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QUESTION 3

3.1

Amahle is 32 years old and earns an annual taxable income of R425 648. She is married and pays medical aid for her husband and herself.

TABLE 1 below indicates rates of tax for individuals for the Tax year 2020/2021

TABLE 1: 2021 TAX YEAR (1 MARCH 2020 - 28 FEBRUARY 2021)

TAX BRACKET	TAXABLE INCOME (R)	RATES OF TAX (R)
1	1 – 205 900	18% of taxable income
2	205 901 – 321 600	37 062 + 26% of taxable income above 205 900
3	321 601 – 445 100	67 144 + 31% of taxable income above 321 600
4	445 101 – 584 200	105 429 + 36% of taxable income above 445 100
5	584 201 – 744 800	155 505 + 39% of taxable income above 584 200
6	744 801 – 1 577 300	218 139 + 41% of taxable income above 744 800
7	1 577 301 and above	559 464 + 45% of taxable income above 1 577 300

TAX REBATES

Tax Rebate	
	2021
Primary	R14 958
Secondary (65 and older)	R8 199
Tertiary (75 and older)	R2 736

MEDICAL AID CREDIT

Per month (R)	2021
For the taxpayer	R319
For the taxpayer and one dependant	R638
For each additional dependant	R215

[Adapted from:www.sars.gov.za]

Use TABLE 1 above to answer the questions that follow.

3.1.1 Name the tax bracket Amahle's annual taxable income falls into. (2)

3.1.2 Write down the tax rebate for the year and the monthly medical aid credit that Amahle qualifies for. (2)

3.1.3 Hence, calculate Amahle's monthly income tax payable. (8)

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3.2

Use the information in TABLE 2 to answer the questions that follow.

Nkosi is flying to Johannesburg for business and wants to hire a car at the airport for 3 days. He has to choose from one of the two options. TABLE 2 below shows the two options available.

TABLE 2: COMPARISION OF CAR HIRE RENTAL FOR A SMALL CAR

OPTION 1		**OPTION 2**	
AVIS CAR HIRE		**BUDGET CAR HIRE**	
Volkswagen Polo or similar		**Renault Kwid or similar**	
Price for 3 days:	ZAR1 254,64	Price per day	ZAR 408,25
Mileage:	500 km per 3 day rental	Mileage:	200 km per day
Customer review:	8,8 excellent	Customer review:	7,8 very good

[Source: www.hippo.co.za]

3.2.1 Calculate the difference in mileage for 3 days between the two options. (3)

3.2.2 Calculate the cost per day for Option 1. (2)

3.2.3 Determine the cost per km for the Renault Kwid. (2)

3.2.4 The cost per km for the Renault Kwid is 81,27 % of that of the Volkwagen Polo.

Verify, using a calculation if this is CORRECT. (4)

3.2.5 Aside from cost, what other factor would influence Nkosi's choice? (2)

[25]

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QUESTION 4

4.1

The world population review rates the following countries in TABLE 3 below as having the highest rate of obesity in the world.

BMI (Body mass index) is a measure that may be used to determine if an individual's weight status is healthy.

TABLE 3: MOST OBESE COUNTRIES 2021

COUNTRY	OBESITY RATE	BMI	POPULATION 2021
American Samoa	74,60%	34,9	55 100
Tokelau	74,40%	Not given	1 373
Naura	61,00%	32,5	10 876
Cook Islands	55,90%	33	17 565
Palau	55,30%	29,4	18 169
Marshal Islands	52,90%	29,2	59 610
Tuvalu	51,60%	29,3	11 931
Niue	50,00%	Not given	1 619
Tonga	48,20%	31,9	106 760
Samoa	47,30%	31,7	**A**

[Source:www.worldpopulationreview.com]

Use the information in TABLE 3 above to answer the questions that follow:

4.1.1 Is the data in TABLE 3 for the Obesity rate and BMI discrete or continuous? Give a reason for your answer. (2)

4.1.2 Calculate the average obesity rate. (3)

4.1.3 Determine the median for the given BMI data. (3)

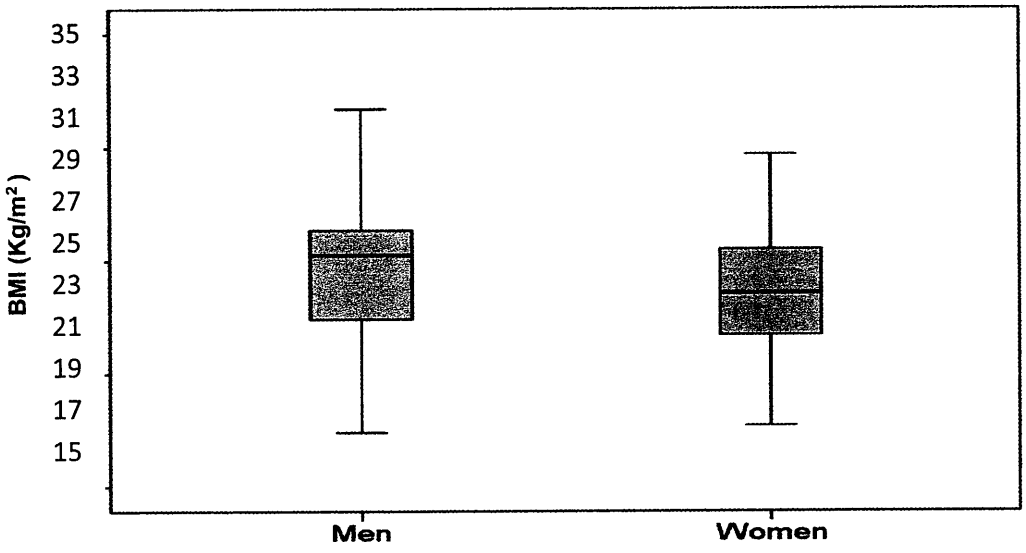
4.1.4 Determine **A**, the population of Samoa in 2021 if the total population is 303 152. (3)

4.1.5 List two factors that would contribute to the high obesity rate in these countries. (2)

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4.2

The box and whisker plot below shows the BMI (Body mass index) of Men and Women.



[Source: www.researchgate.net]

Use the information above to answer the following questions

4.2.1 Identify Quartile 2 for the Men's BMI. (2)

4.2.2 The average height of the men is 1,7 metres. Use your answer from **4.2.1** to determine the men's weight.

You may use the formula:

$$\textbf{BMI} = \frac{\textbf{weight in kilograms}}{(\textbf{height in metres})^2}$$ (3)

4.2.3 A nurse stated that there is difference of 1 between the inter quartile range (IQR) for men and women.

Verify if this statement is CORRECT, showing all calculations.

You may use the formula:

IQR = Q3 – Q1 (5)

4.2.4 Consider the men's BMI. Provide a reason why the men's BMI would be higher than the women? (2)

[25]

TOTAL: [100]

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GRADE 12

MATHEMATICAL LITERACY

ADDENDUM

COMMON TEST

APRIL 2021

This Addendum consists of 2 pages with 1 Annexure.

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ANNEXURE A

QUESTION 2.1

Tax Invoice

THE METRO BILL
REVENUE DEPARTMENT
P. O. Box 828, Durban. 4 000
Tel: (031) 324 5000 Fax: (031) 324 5111
E-mail: revline@durban.gov.za
Web: www.durban.gov.za
Council VAT Registration No.: 488 019 3505

Tax Invoice No.: 137000891

Mr N Biyela
P. O. Box 1813
Durban
4 000

29000137891

Date	Account Number	VAT Number	Guarantee (R)	Deposit (R)
2021/02/21	29000137891	N/A	0,00	3, 500.00

Reference	Details	Amount (R)
	Balance brought forward	**1, 247.19**
	Payment – Thank you (D/Delay "00")	1, 250.00Cr
	Sub – total	2.81Cr
	Current month's charges	**B**
	VAT	249,10
	Total current month's charges	**C**

Current month's charges are due by 2021/02/26.

Reference: 29000137891, 4031, DURBAN
Residential 1 Phase - Scale 4

CT Ratio	1.00000	VT Ratio	1.00000	Installed Capacity	Rate (c)/kWh: **182,09c/kWh**

Meter	Reg.	Date/Previous Meter Reading		Date/Current Meter Reading		Usage
A009	Dbn9.	18/01/2021	**246 701*kWh***	15/02/2021	**247 613*kWh***	**A**

N.B: RESIDENTIAL SCALE 4 RATE IN cents (c)/kWh EXCLUDING VAT is 182,09.

Source: [www.durban.gov.za]

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ANSWER SHEET

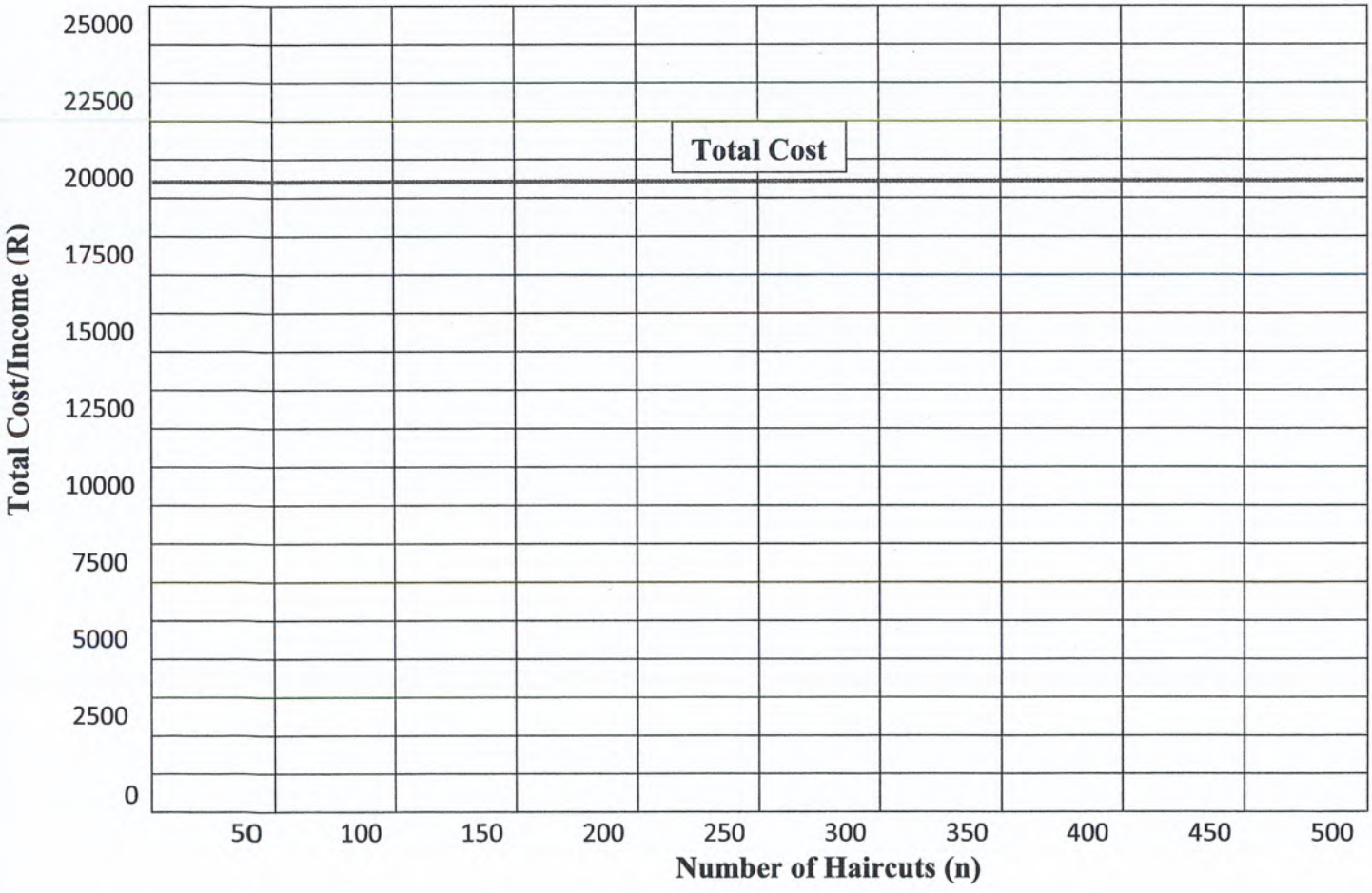
NAME OF LEARNER: _____ **GRADE 12** ____

QUESTION 2.2.2

Total No. of Haircuts (n)	0	50	100	150	200	250	300	350	400	450	500
Total Cost (R)	19200	19200	19200	19200	19200	19200	19200	19200	19200	19200	19200
Total Income (R)	0	2 500	5 000	7 500	10 000						

QUESTION 2.2.3

TOTAL COST AND TOTAL INCOME FOR ERIC'S BARBESHOP



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MARKING GUIDELINE

APRIL 2021

MARKS: 100

SYMBOL	EXPLANATION
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RD/RM	Reading from a table/ graph/ diagram/Map
SF	Correct substitution in a formula
O	Opinion/ reason/deduction/example/Explanation
J	Justification
R	Rounding off
F	deriving a formula
AO	Answer only full marks
P	Penalty e.g. for units, incorrect rounding off etc.
NPR	No penalty for rounding / units

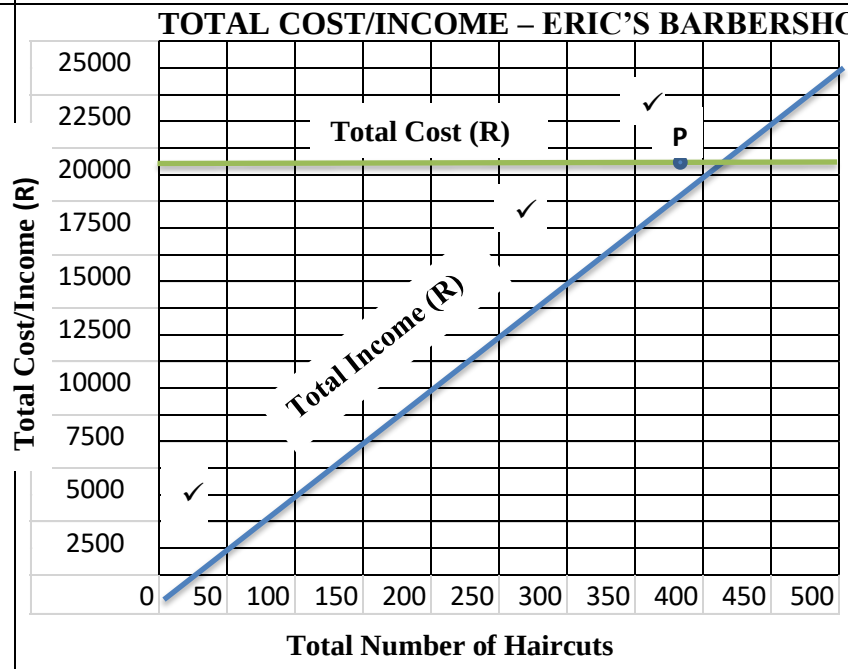
This marking guideline consists of 6 pages.

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QUESTION 1 [20 MARKS]			
No.	**Solution**	**Explanation**	**T&L**
1.1.1	Numerical✓✓A	2A correct answer (2)	D L1
1.1.2	379; 392; 396; 404; 437; 519; 560; 569; 904; 1 493; 3 688✓✓A	2A ascending order (2)	D L1
1.1.3	11 districts✓✓RT	2RT number of districts (2)	D L1
1.1.4	eThekwini✓ RT with 156 259 confirmed cases✓RT	1RT correct district 1RT correct number of cases (2)	D L1
1.1.5	6 531✓✓RT	2RT correct number (2)	D L1
1.2.1	Time in months $= 20 \times 12$✓M $= 240$✓A	1M multiplying by 12 1A correct answer (2) **AO**	M L1
1.2.2	Real Cost of Loan $= 240 \times$ R7 050✓MCA $=$ R1 692 000✓A	**CA from Q1.2.1** 1MCA multiplying by 240 1A correct answer (2) **AO**	F L1
1.2.3	Total interest $=$ R1 692 000 $-$ R730 554✓MCA $=$ R961 446✓CA	**CA from 1.2.2** 1MCA for subtracting CA answer (2) **AO**	F L1
1.2.4	Monthly interest $=$ R961 446 $\div$ 240✓MCA $=$ R4 006,03✓CA	**CA from 1.2.3** 1MCA dividing by 240 1CA correct answer (2) **AO**	F L1
1.2.5	Part of monthly repayment $=$ R7 050 $-$ R4 006,03✓MCA $=$ R3 043,97✓CA	**CA from 1.2.4** 1MCA subtracting 1CA correct answer (2) **AO**	F L1
			[20]

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QUESTION 2 [30 MARKS]

2.1.1	$A = 247\,613 - 246\,701$✓MA $= 912kWh$✓CA	1MA subtracting correct values 1CA answer **AO** (2)	M L1
2.1.2	$B = 912 \times 182{,}09c$✓MCA $= 166\,066{,}08c$✓S $= R1\,660{,}66$✓C OR B=912 ×1,8209✓✓ MCA =R1 660,66✓CA	**CA from 2.1.1** 1MCA multiplying 1S simplification 1C converting to rand OR 1MCA multiplying 1C conversion CA answer (3)	F L2
2.1.3	$C = R1\,660{,}66 - (R2{,}81 + R249{,}10)$✓MCA $= R1\,906{,}95$✓CA	**CA from 2.1.2** 1MCA subtracting 1CA answer (2)	F L1
2.2.1	Total fixed cost $= (2 \times R5\,500) + R8\,200$✓MA $= R19\,200$✓A	1MA for multiplying 5 500 by 2 1A answer **AO** (2)	F L1
2.2.2		3A 1 tick for correct pairs values (3)	F L2
2.2.3		2A for the correct line 1A for correct position for P (3)	F L3

Total No. of Haircuts	250	300	350	400	450	500
Total Cost (R)	19200	19200	19200	19200	19200	19200
Total Income (R)	12500	✓A 15000	17250	✓A 20000	22500	✓A 25000

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2.2.4	Total income $= 40 \times 50 \times 20$✓MA $=$ R40 000✓CA Total expenses $=$ R19 200 Profit $=$ R40 000 $-$ R19 200✓MA $=$ R20 800✓CA Mr Eric's claim is VALID✓O	1MA multiplying by 20 1CA answer 1MA subtracting 1CA answer 1O opinion (5)	F L4
2.3.1	Total Expenditure $= \frac{\text{R1 929 234}}{\text{R5 040 322}}$ ✓MA $\times$ 100%✓MA $= 38{,}28\%$✓A	1MA dividing 1MA multiplying 1A correct answer (3)	F L2
2.3.2	75% of R3 055 713 $=$ R2 291 784,75✓MA January export earnings $=$ R3 055 713 $-$ R2 291 784,75 $=$ R763 928,25✓A 47% of R1 984 609 $=$ R932 766,23✓M Local earnings $=$ R1 984 609 $-$ R932 766,23 $=$ R1 051 842,77✓A Total income for January $=$ R1 051 842,77 $+$ R763 928,25 $=$ R1 815 771,02✓A Loss for January $=$ R1 815 771,02 $-$ R1 929 234✓M $=$ R113 462,98✓CA **OR** January export earnings $= 0{,}25 \times$ R3 055 713✓MA $=$ R763 928,25✓A Local earnings $= 0{,}53 \times$ R1 984 609✓MA $=$ R1 051 842,77✓A Total income for January $=$ R1 051 842,77 $+$ R763 928,25 $=$ R1 815 771,02✓A Loss for January $=$ R1 815 771,02 $-$ R1 929 234✓M $=$ R113 462,98✓CA	1MA multiplying by 75% 1A answer 1M multiplying by 47% 1A answer 1A addition and answer 1M subtracting 1CA answer 1MA multiplying by 25% 1A answer 1MA multiplying by 53% 1A answer 1A addition and answer 1M subtracting 1CA answer (7)	F L3
			[30]

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QUESTION 3 [25 MARKS]			
Q	**Solution**	**Explanation**	**T &L**
3.1.1	Tax Bracket 3 ✓✓RT	2RT correct bracket (2)	F L1
3.1.2	Primary Tax Rebate R14 958✓RT Medical aid credit per month R638✓RT	1RT correct value 1RT correct value (2)	F L1
3.1.3	✓A Monthly tax = R67 144 + 0,31(R425 648 – R321 600) ✓SF = R99 398,88✓CA = R99 398,88 – (R14 958) ✓MCA = R84 440,88✓CA = R84 440,88– (R7 656) ✓MCA = R76 784,88 = R76 784,88 ÷ 12 ✓MA = R6398,74 ✓CA	1A correct tax bracket 1SF annual taxable income 1CA simplification 1MCA subtracting rebate 1CA simplification 1MCA subtracting medical credit for the year 1MA dividing by 12 1CA answer (8)	F L3
3.2.1	✓MA Difference in mileage = (200 × 3) – 500 ✓RT = 100 km✓A	1MA multiplying by 3 1RT subtracting correct values 1A correct answer (3)	F L2
3.2.2	Cost per day for Option 1 = R1254,64 ÷ 3 ✓MA = R418,21✓A	1MA dividing by 3 days 1A answer (2)	F L2
3.2.3	Cost per km for Renault Kwid = R408,25 ÷ 200✓MA = R2,04 per km✓A	1MA dividing by 200 1A answer (2)	F L2
3.2.4	Cost per km for Polo = R1254,64 ÷ 500 ✓MA = R2.51✓A $\% = \frac{2,04}{2,51} \times 100$ ✓MCA = 81,27 Statement is CORRECT✓O	1MA dividing by 500 1A correct answer 1MCA dividing by 2,51 1O opinion (4)	F L4
3.2.5	Customer review of 8.8 that is excellent. ✓✓O Any valid reason	2O opinion (2)	F L4
			[25]

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QUESTION 4 [25 MARKS]			
4.1.1	Continuous✓A Measured value✓A	1A correct answer 1A correct answer (2)	DH L1
4.1.2	Average obesity rate ✓MA = (74,60+74,40+61+55,90+55,30+52,90+51,60+50+48,20+47,30) ÷ 10✓MA = 57,12%✓CA	1MA adding correct values 1MA dividing by 10 1CA answer (3)	DH L2
4.1.3	Median BMI =29,2; 29,3; 29,4; 31,7; 31,9; 32,5; 33; 34,9✓A =(31,7+31,9) ÷ 2✓MA =31,8✓CA	 1A arranging in order 1MA dividing by 2 1CA answer (3)	DH L2
4.1.4	Population of Samoa : A=303 152 - (55100+1373+10876+17565+18169+59610+11931+ 1619+106760)✓MA =303 152 –283 003✓M = 20149✓CA	 1MA adding correct values 1M subtracting 1CA answer (3)	DH L3
4.1.5	Unhealthy lifestyle✓O Lack of exercise✓O Any valid reason	2O opinion (2)	DH L4
4.2.1	Q2 = 25✓✓RG	2RG reading correct value **Accept from 24 to 25** (2)	DH L2
4.2.2	$25 = \frac{\text{weight in kilograms}}{(1,7)^2}$ ✓SF 25×1.7^2 = weight in kg✓S Weight in kg=72,25kg✓CA	**CA from 4.2.1** 1SF substitution 1S simplification 1CA answer (3)	DH L3
4.2.3	Men's IQR = 26 – 21 ✓RG = 5 ✓CA Women's IQR = 25 –20 ✓RG = 5 Difference = 5-5 = 0✓CA Statement is INCORRECT. ✓O	1RG subtracting 1CA answer 1RG subtracting 1CA answer 1O opinion **Accept a leeway of 1** (5)	DH L4
4.2.4	Different levels of development✓✓O Any valid reason	2O opinion (2)	DH L4
			[25]

TOTAL: 100

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