Downloaded from Stanmorephysics.com



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12



MATHEMATICAL LITERACY P1

NOVEMBER 2021

downloaded from stanmorephysics.com

MARKS: 150

TIME: 3 hours

**This question paper consists of 14 pages,
1 answer sheet and an addendum with 3 annexures.**

Copyright reserved

Downloaded from Stanmorephysics.com

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.

2. 2.1 Use the ANNEXURES in the ADDENDUM to answer the following questions:

   ANNEXURE A for QUESTION 2.2
   ANNEXURE B for QUESTION 3.2
   ANNEXURE C for QUESTION 4.3

   2.2 Answer QUESTION 4.2.2 on the attached ANSWER SHEET.

   2.3 Write your centre number and examination number in the spaces provided on the ANSWER SHEET. Hand in the ANSWER SHEET with your ANSWER BOOK.

Stanmorephysics.com

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 appropriately according to the given context, unless stated otherwise.

8. Indicate units of measurement, where applicable.

9. Diagrams are NOT necessarily drawn to scale, unless stated otherwise.

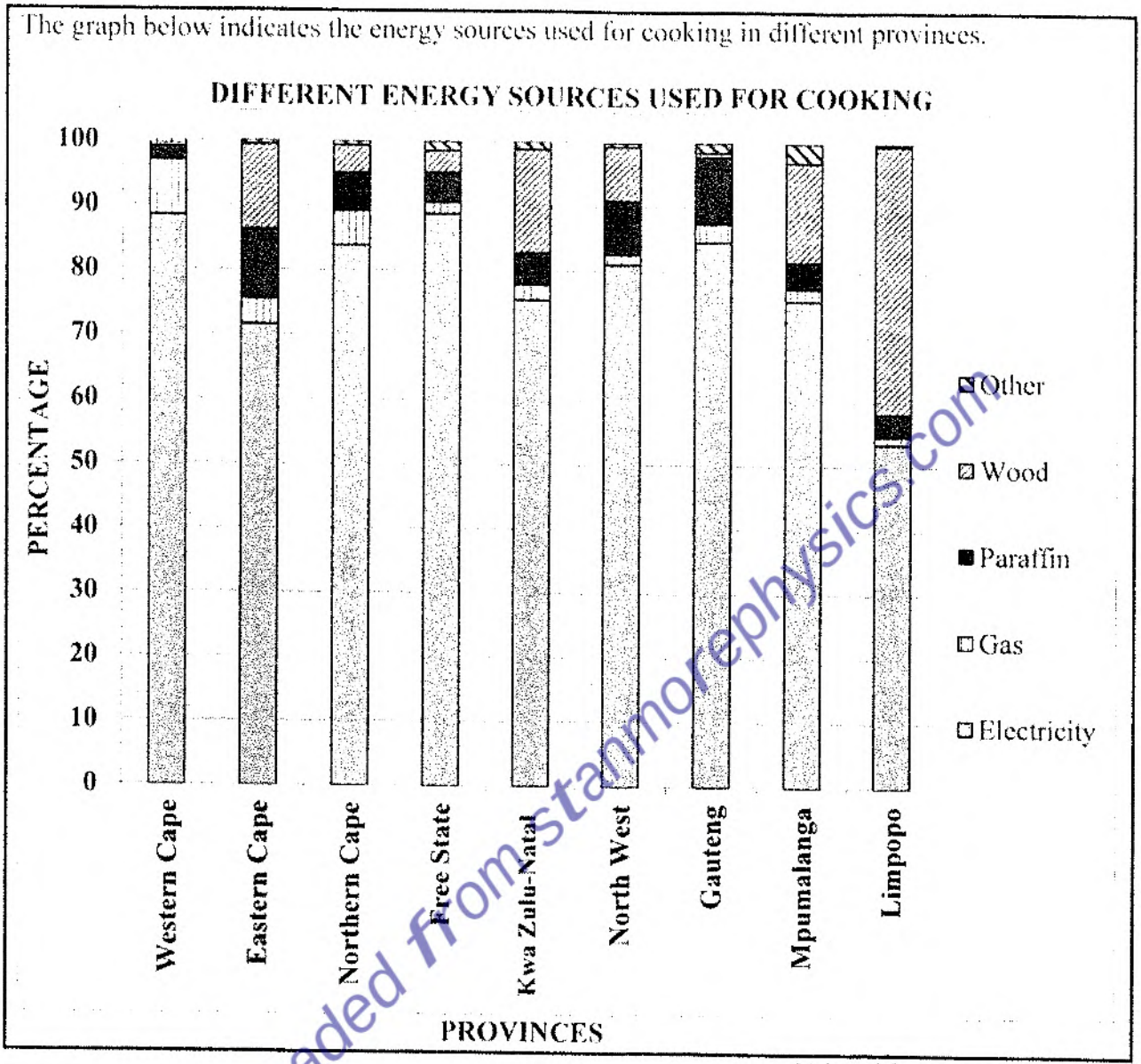
10. Write neatly and legibly.

downloaded from stanmorephysics.com

Copyright reserved

Downloaded from Stanmorephysics.com

1.2 The graph below indicates the energy sources used for cooking in different provinces.



[Adapted from www.statssa.gov.za

Use the graph above to answer the questions that follow.

1.2.1 Identify the source of energy that is mostly used for cooking. (2)

1.2.2 Name the province that uses the most wood for cooking. (2)

1.2.3 The price of paraffin fluctuates. On 3 February 2021 the price was 764,59 c/ℓ.

(a) Write down (in rand) the cost of ONE litre of paraffin. (2)

(b) Determine, to the nearest rand, the cost of 12,5 ℓ of paraffin. (2)

1.2.4 Name another form of energy that could be used for cooking which could fall under the 'Other' category. (2)

Copyright reserved

Downloaded from Stanmorephysics.com

QUESTION 1

1.1 TABLE 1 below shows the fuel price (in US dollars) in six African countries on 05/06/2019 and 01/03/2021 with the exchange rate per currency on 01/03/2021.

TABLE 1: FUEL PRICE (IN US DOLLARS) IN SIX AFRICAN COUNTRIES

COUNTRY	FUEL PRICE IN US$		CURRENT DOLLAR EXCHANGE RATE/CURRENCY ON 01/03/2021
	05/06/2019	01/03/2021	
South Africa	1,04	1,061	R15.36
Angola	0,47	0,254	626,41 Angolan kwanzas
Zimbabwe	0,80	1,258	$1,258
Namibia	0,88	0,796	15,36 Namibian dollars
Swaziland	0,86	0,87	15,35 Swazi emalangeni
Botswana	0,84	0,732	11,14 Botswana pulas

[Adapted from www.globalpetrolprices.com]

Use TABLE 1 to answer the questions that follow.

1.1.1 Calculate the fuel price increase for Zimbabwe from 05/06/2019 to 01/03/2021. (2)

1.1.2 Write down the current exchange rate of the Botswana pula to the US dollar in the following format:

1 Botswana pula = ... US dollars (2)

1.1.3 Identify the countries which showed a decrease in the fuel price from 05/06/2019 to 01/03/2021. (2)

1.1.4 Arrange, in descending order, the fuel price in US$ for 01/03/21. (2)

1.1.5 The probability of randomly selecting a country that is not South Africa is $\frac{5}{6}$.

Write this probability in decimal form rounded to THREE decimal places. (2)

Copyright reserved

Downloaded from Stanmorephysics.com

1.3 The following questions were taken from a company's information sheet:

A. How many hours per day do you spend reading?

B. How many books have you read in the last 16 weeks?

C. How many books have you bought in the last 3 months?

D. Were the books you bought hard copies or soft copies?

E. Do you believe that we should pay 15% VAT on book prices?

[Adapted from www.developingquestions.co.za]

Study the information above and answer the questions that follow.

1.3.1 Identify the data collection instrument that was used to collect the above information. (2)

1.3.2 Name the next step in the data cycle after the instrument has been completed and collected. (2)

1.3.3 State whether the choices given for question **D** represent categorical or numerical data. (2)

1.3.4 Write the acronym *VAT* in full. (2)

1.3.5 Give an example of a business that will find the above data useful. (2)
[30]

Copyright reserved

Downloaded from Stanmorephysics.com

QUESTION 2

2.1 Mrs Smith would like to buy a car but does not have the full cash amount. She downloaded TWO payment options for TWO different cars as shown in TABLE 2 below.

TABLE 2: PAYMENT OPTIONS FOR TWO DIFFERENT CARS

ITEM	FORD FIGO 	VW POLO 
Retail price/Cash price (including VAT)	R215 100	R220 300
Deposit	5%	0%
Monthly instalment	R2 999,00	R3 345,00
Residual value	30%	R116 759
Monthly admin fee (not included in monthly instalment)	R69,00	2,08% of the monthly instalment
Term agreement	72 months	48 months
VAT	15%	15%

[Adapted from www.vw.co.za and www.ford.co.za]

*Residual value is the last month's payment.

Use TABLE 2 above to answer the questions that follow.

2.1.1 State what type of payment option is shown in TABLE 2. (2)

2.1.2 Calculate the deposit amount for the Ford Figo. (2)

2.1.3 Write down (in simplified form) the ratio of the term agreement of the Ford Figo to the VW Polo. (2)

2.1.4 Which ONE of the two vehicles will be more cost effective in terms of monthly budget? (2)

2.1.5 Calculate the total cost of the VW Polo if the monthly instalment remained the same throughout the contract period, except for the final payment.

You may use the following formula:

Total cost
= Total value of monthly instalments + admin fees + residual value (6)

2.1.6 Mrs Smith invested R60 000 at a bank for two years with compound interest. In the first year she received an interest rate of 4,3% per annum while in the second year the interest rate was 5,1% per annum.

Mrs Smith stated that she would have enough money at the end of the second year to pay the residual value of the Ford Figo.

Verify, showing ALL calculations, whether her statement is CORRECT. (8)

Copyright reserved

Downloaded from Stanmorephysics.com

2.2 ANNEXURE A shows an invoice of the cellphone contracts taken out by Mr Fortune.

Use ANNEXURE A to answer the questions that follow.

2.2.1 State the number of cellphone contracts shown on this invoice. (2)

2.2.2 Name the cellphone contract which shows the most expensive device. (2)

2.2.3 Show how the VAT amount of R142,95 was calculated. (2)

2.2.4 Calculate the missing value **A**. (2)

2.2.5 State, in words, the probability of randomly selecting a cellphone contract that is not from ABC. (2)

[32]

Downloaded from Stanmorephysics.com

QUESTION 3

3.1 South Africa is in the middle of a potentially wet season as heavy rainfalls continue to fall over large parts of the country, thus improving the country's water situation.

TABLE 3 shows the full storage capacity and dam levels as a percentage of the full storage capacity in different provinces in South Africa on 5 April 2021. The dam-level readings are taken on the same day each week.

TABLE 3: DAM LEVELS IN DIFFERENT PROVINCES ON 5 APRIL 2021

PROVINCE	NET FSC (MILLION m³)	THIS WEEK (%)	LAST WEEK (%)	LAST YEAR (%)
Eastern Cape	1 823	55	**D**	56
Free State	15 657	100	99	77
Gauteng	128	100	101	101
KwaZulu-Natal	4 784	73	73	61
Limpopo	1 480	88	88	70
Mpumalanga	2 539	89	89	75
North West	867	82	82	71
Northern Cape	147	102	105	95
Western Cape	1 866	52	**D**	40

[Adapted from https://sawx.co.za/state-of-dams]

Stanmorephysics.com

Net FSC (million m³) = net full storage capacity in million cubic metres

Use TABLE 3 to answer the questions that follow.

3.1.1 Determine the date on which the reading of the dam level was taken last week. (2)

3.1.2 Write down, in words, the actual value of the net FSC for Gauteng. (2)

3.1.3 Identify the province with the third lowest dam level percentage for last year. (2)

3.1.4 Determine which province had the highest percentage increase in dam levels from last year to this week. (2)

3.1.5 Calculate the missing value **D** if the mean percentage storage capacity for last week was 83%. (5)

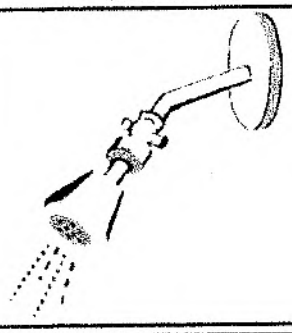
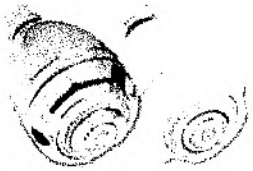
3.1.6 Determine, as a fraction, the probability of randomly selecting a province with dam levels exceeding 100%, for both this week and last week. (2)

3.1.7 Calculate (in m³) the actual net FSC of Free State for last week. (3)

Downloaded from Stanmorephysics.com

3.2 In an average middle-class household in South Africa a 10-minute shower costs almost R13 (or R1,30/min) if you have a normal 15 litre/min shower head. By changing to a low-flow shower head and reducing shower time to 6 minutes, you can reduce this to R4,20 per shower (or 70c/min).

The graph on ANNEXURE B shows more detailed information on water and energy use per shower for a normal shower head and a low-flow shower head.

GLOSSARY	SKETCH OF LOW-FLOW SHOWER HEAD	PICTURE OF A NORMAL SHOWER HEAD
A low-flow shower head reduces the rate of water flow.		

Use ANNEXURE B and the above information to answer the questions that follow.

3.2.1 A four-minute shower uses 1,7 kWh of energy. A ten-minute shower uses 4,3 kWh of energy.

Calculate the percentage increase in kWh of energy used when taking a 4-minute shower compared to taking a 10-minute shower.

You may use the following formula:

$$\text{Percentage increase} = \frac{\text{kWh used for 10 min} - \text{kWh used for 4 min}}{\text{kWh used for 4 min}} \times 100\%$$ (3)

3.2.2 Give ONE possible reason why you would advise someone to use a low-flow shower head rather than a normal shower head. (2)

3.2.3 Calculate the range of the number of litres of water used during a 2-minute shower and an 8-minute shower using a normal shower head. (3)

[26]

Copyright reserved

Downloaded from Stanmorephysics.com

QUESTION 4

4.1 Bobby lives in India and wants to start his own take-away business. His speciality is chicken biryani. All his ingredients will be bought in bulk.

Bobby intends selling a plate of chicken biryani for eighty rupees (Rs80).

TABLE 4 shows the estimated cost of ingredients used to make 8 plates of chicken biryani.

TABLE 4: ESTIMATED COST (IN Rs) OF INGREDIENTS USED TO MAKE 8 PLATES OF BIRYANI

PRODUCT	COST(IN Rs)
1 kg chicken	200
1 kg basmati rice	120
Masala powder	10
Other ingredients	62

[Adapted from www.quora.com]

Stanmorephysics.com

Each plate of biryani will be packed in a disposable food container that costs Rs2,43 each.

GLOSSARY	PICTURE OF A PLATE OF BIRYANI
Biryani is a mixed rice dish made with spices, rice and meat	

Use TABLE 4 and the information above to answer the questions that follow.

4.1.1 Determine (in Rs) the price of 520 g of chicken. (3)

4.1.2 Calculate the total cost to make and package a plate of chicken biryani. (5)

4.1.3 Bobby claims that he can make more than 50% profit on one plate of chicken biryani.

Verify, by showing ALL calculations, if his claim is valid. (5)

4.1.4 The exchange rate between South African rands and Indian rupees on 3 March 2021 is given in TABLE 5 below:

TABLE 5: EXCHANGE RATE

SOUTH AFRICAN RAND (ZAR)	INDIAN RUPEES (Rs)
1	4,8346707
0,206839	1

[Adapted from www.xe.com]

Determine (in ZAR) the price of masala powder. (3)

Downloaded from Stanmorephysics.com

4.2 Bobby got the idea of selling biryani from his niece Janet who has her own takeaway business in South Africa.

Janet's variable cost to make one plate of chicken biryani is R13,00.
Her fixed cost amounts to R600.

[Adapted from www.quora.com]

Use the information above to answer the questions that follow.

4.2.1 Janet uses the equation below to calculate her total cost:

Total cost = R600,00 + 13 p, where p = number of plates.

Use the equation to determine the number of plates sold if the total cost was R1 380,00. (4)

4.2.2 TABLE 6 below shows Janet's total cost and income from selling different numbers of plates of biryani.

TABLE 6: INCOME AND COST OF SELLING DIFFERENT NUMBERS OF PLATES OF BIRYANI

NUMBER OF PLATES	0	10	30	50	70	90	100
INCOME (R)	0	250	750	1 250	1 750	2 250	2 500
COST (R)	600	730	990	1 250	1 510	1 770	1 900

The income graph has already been drawn on the attached ANSWER SHEET.

Use TABLE 6 and the same grid on the ANSWER SHEET to draw another line graph representing the cost of different numbers of plates of biryani. (3)

4.2.3 Determine the minimum number of plates of biryani that Janet must sell before she starts making a profit. (2)

Copyright reserved

Downloaded from Stanmorephysics.com

4.3

Tourism in India is important for the country's economy and it is growing rapidly.

The *Travel and Tourism Competitiveness Report 2019* has ranked India 34th out of 140 countries overall.

ANNEXURE C indicates the number of tourist arrivals in India as well as the countries of origin of these tourist arrivals.

Use ANNEXURE C to answer the questions that follow.

4.3.1 Write down, as a decimal, the probability of selecting a tourist that comes from 'Other' countries. (2)

4.3.2 State the trend in the number of tourist arrivals in India from 2015 to 2019. (2)

4.3.3 For 2019 the total number of tourist arrivals in India was 10,93 million.

Bobby states that more than 4 500 000 tourists who visited India in 2019 came from Bangladesh.

Verify, showing ALL calculations, whether his statement is CORRECT. (4)

4.3.4 The pie chart shows the total percentage of tourist arrivals in India for 2019 as 99,8%.

Give a valid reason why this value is not 100%. (2)

[35]

Copyright reserved

Downloaded from Stanmorephysics.com

QUESTION 5

5.1 Marius, who is 64 years old, earned an annual taxable income of R551 762.00 for the 2019/20 tax year. During the 2019/20 tax year Marius was not a member of any medical fund.

TABLE 7 below shows the tax table for the 2019/20 tax year.

TABLE 7: TAX RATES FOR 2019/20 TAX YEAR (1 Mar. 2019 to 28 Feb. 2020)

TAX BRACKET	TAXABLE INCOME (R)	RATES OF TAX (R)
1	1–195 850	18% of taxable income
2	195 851–305 850	35 253 + 26% of taxable income above 195 850
3	305 851–423 300	63 853 + 31% of taxable income above 305 850
4	423 301–555 600	100 263 + 36% of taxable income above 423 300
5	555 601–708 310	147 891 + 39% of taxable income above 555 600
6	708 311–1 500 00	207 448 + 41% of taxable income above 708 310
7	1 500 001 and above	532 041 + 45% of taxable income above 1 500 00

[Adapted from www.sars.gov.za]

TABLE 8 below shows the tax rebates and medical credits for the 2019/20 tax year.

TABLE 8: TAX REBATES AND MEDICAL AID CREDITS FOR THE 2019/20 TAX YEAR

TAX REBATE	
Primary	R14 220
Secondary (65 and older)	R7 794
Tertiary (75 and older)	R2 601
MEDICAL CREDITS PER MONTH FOR MEDICAL FUND MEMBERS	
Main member	R310
First dependent	R310
Each additional dependent	R209

[Adapted from www.sars.gov.za]

Use TABLE 7 and TABLE 8 above to answer the questions that follow.

5.1.1 Identify which tax bracket Marius falls in, based on his taxable income. (2)

5.1.2 Calculate the amount of tax Marius must pay for the 2019/20 tax year. (5)

5.1.3 Marius stated that if he had been one year older, he would have saved more than R600 monthly on taxes paid during the 2019/20 tax year.

Verify, showing ALL calculations whether his statement is CORRECT. (6)

5.1.4 Marius is considering joining a medical fund. He plans to include his wife and two grandchildren.

Determine the total monthly medical credits he would qualify for if he joined a medical fund. (4)

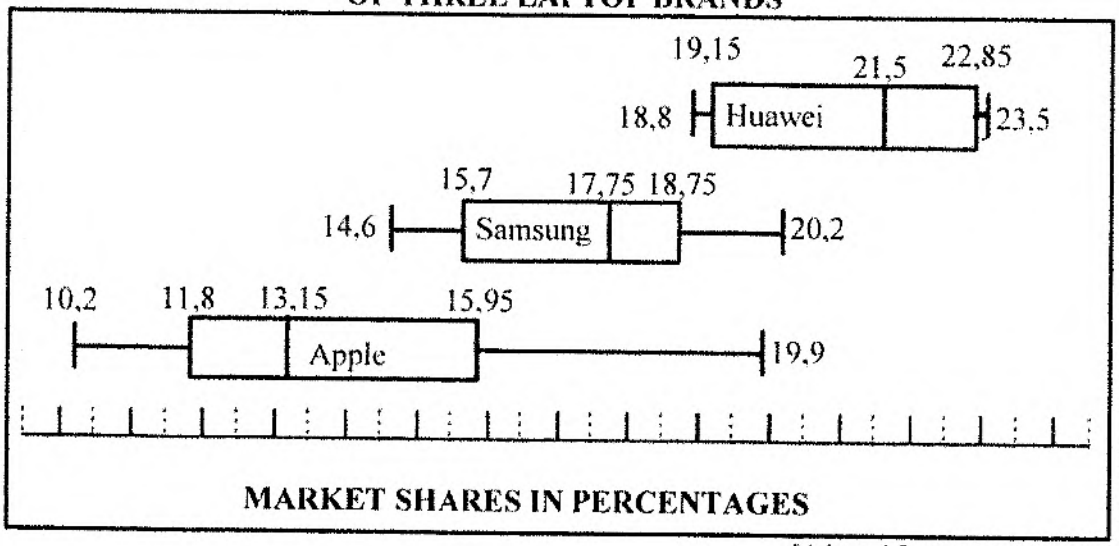
Copyright reserved

Downloaded from Stanmorephysics.com

5.2 Marius wants to buy a new laptop. He studied the available data for the three most popular brands of laptops sold in South Africa.

The box and whisker plots below show (in percentages) the spread of the market share of the Samsung, Apple and Huawei laptop brands from the fourth quarter in 2019 to the third quarter in 2020.

BOX-AND-WHISKER PLOTS SHOWING MARKET SHARE OF THREE LAPTOP BRANDS



[Adapted from www.idc.com]

Use the box and whisker plots above to answer the questions that follow.

5.2.1 (a) Write down the name of the most popular laptop brand. (2)

(b) Hence, write down the 50th percentile of the brand identified in QUESTION 5.2.1(a). (2)

5.2.2 Calculate the interquartile range (IQR) of the Samsung brand. (4)

5.2.3 A data analyst claims that 75% of the dataset of Apple was less than 16%.

Explain whether or not his statement is valid. (2)
[27]

TOTAL: 150

Copyright reserved

Downloaded from Stanmorephysics.com

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

ADDENDUM

NOVEMBER 2021

This addendum consists of 4 pages with 3 annexures.

Copyright reserved

Downloaded from Stanmorephysics.com

ANNEXURE A

QUESTION 2.2

CELLPHONE CONTRACT INVOICE

Cellphone Account

Customer Care
Tel: +27083245 Tel:123(free from cellphone)
E-mail: customercare@ABC.co.za
Website: www.abc.co.za

Mr SJ Fortune
5 Second Avenue
Zone 2
Smelderado
2463

Invoice date	17-01-2021
Account Number	BA4536782C
Payment Method	Direct Debit
Due Date	01-03-2021
Arrears	R0,00

Summary of charges for your ABC plan:

ABC Made For You S Contract date: 13-03-2019 to 12-03-2021

Description	**From**	**To**	**Amount excl. VAT**
Device	17-12-2020	16-01-2021	260,87
ABC made for You S	17-01-2021	16-02-2021	94,78

Subtotal: (excl. 15% VAT) **R 355,65**

ABC made for You XS Contract date: 13-05-2019 to 12-05-2021

Description	**From**	**To**	**Amount excl. VAT**
Device	17-12-2020	16-01-2021	R173,91
ABC made for You XS	17-01-2021	16-02-2021	R86,09

Subtotal: (excl. 15% VAT) **R260,00**

Your ABC Choice 5GB Contract date: 19-08-2019 to 18-08-2021

Description	**From**	**To**	**Amount excl. VAT**
Device	17-12-2020	16-01-2021	R165,22
Your ABC Choice 5GB	17-01-2021	16-02-2021	R172,13

Subtotal: (excl. 15% VAT) **R337,35**

VAT total 15% **R142,95**

Total amount due for current period (VAT incl.) **A**

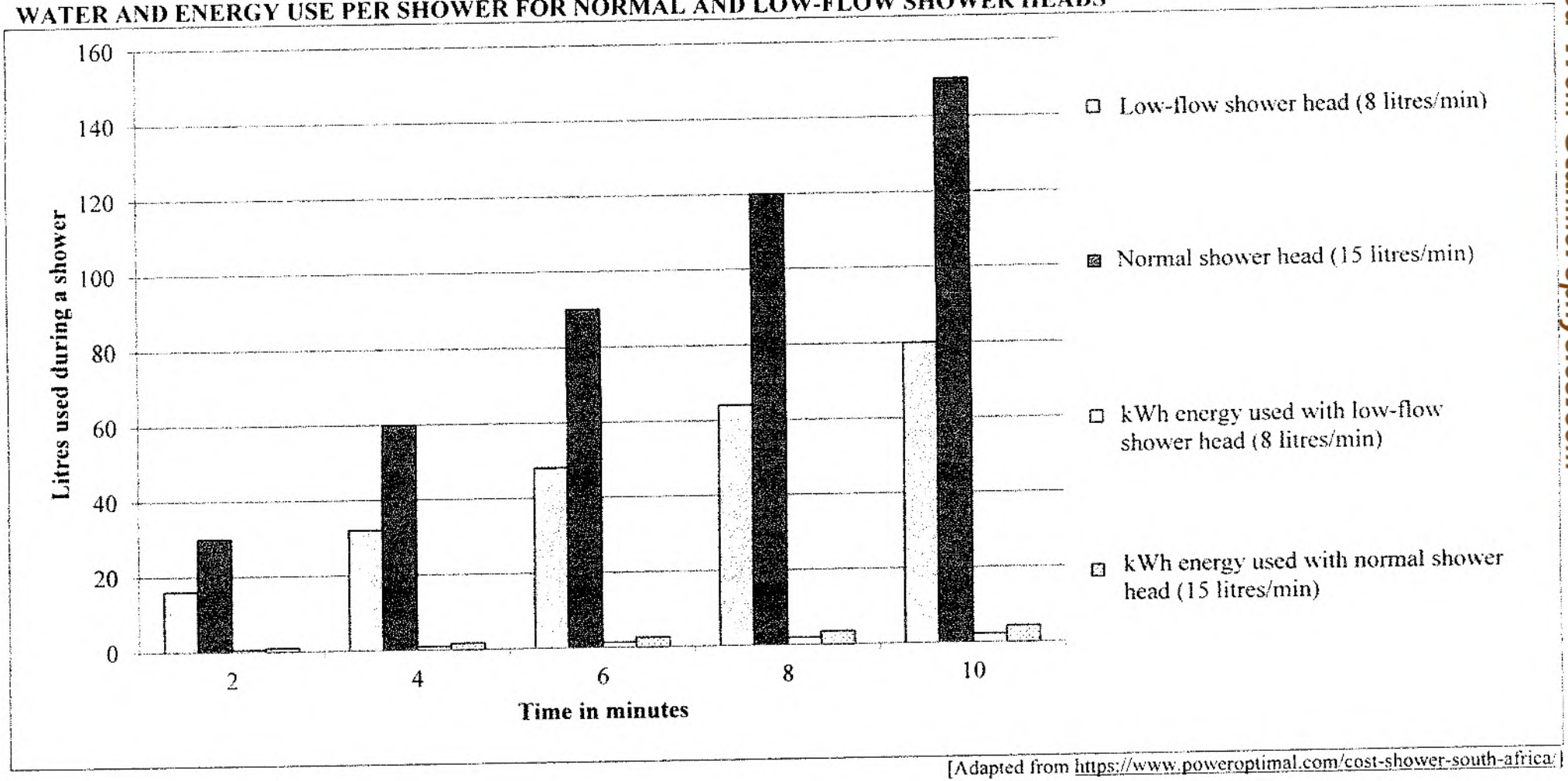
Copyright reserved

Downloaded from Stanmorephysics.com

ANNEXURE B

QUESTION 3.2

WATER AND ENERGY USE PER SHOWER FOR NORMAL AND LOW-FLOW SHOWER HEADS

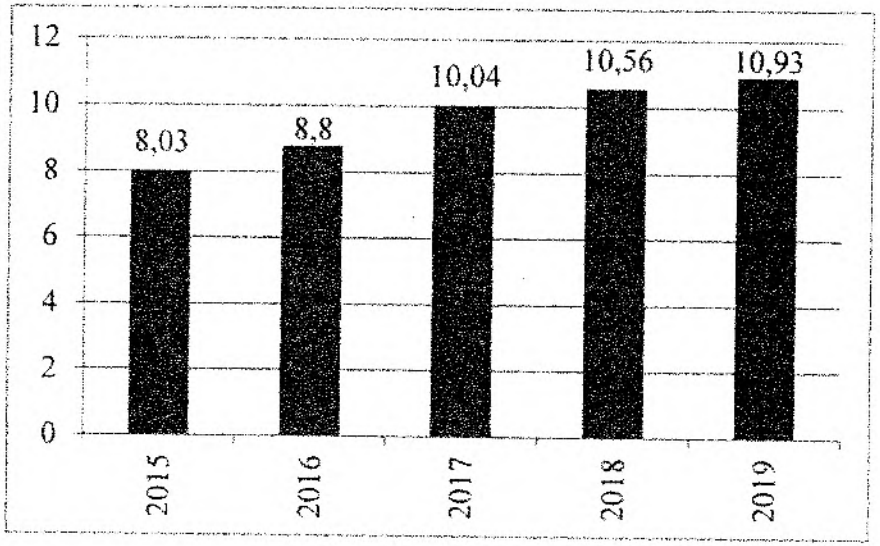


[Adapted from https://www.poweroptimal.com/cost-shower-south-africa/]

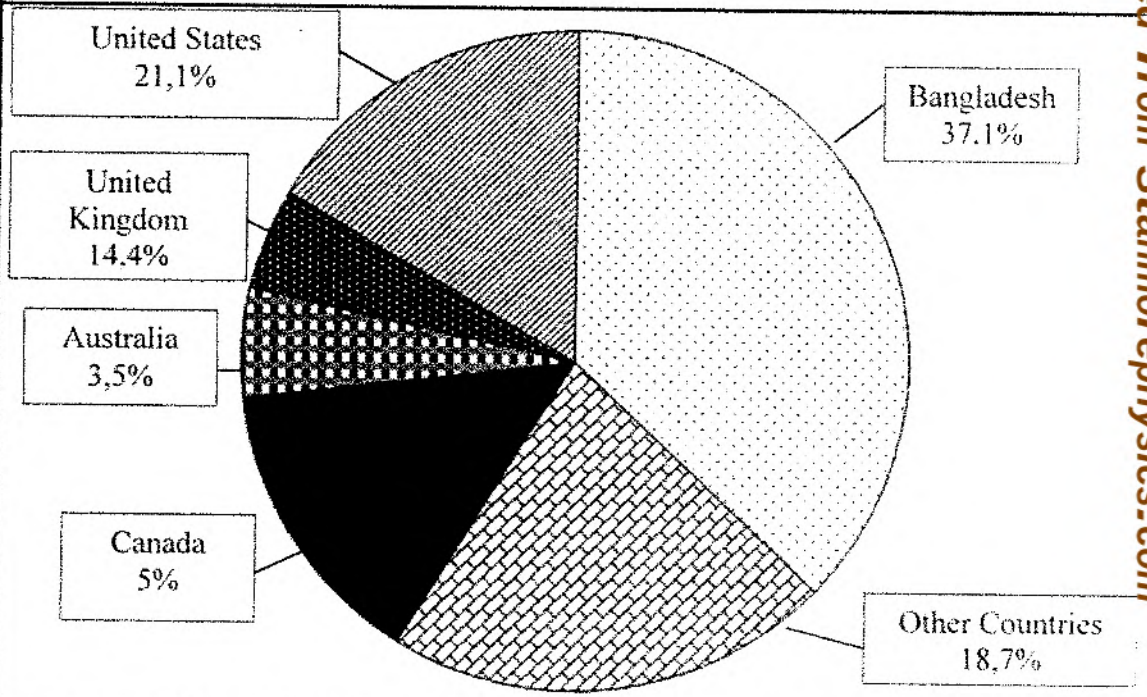
ANNEXURE C

QUESTION 4.3

NUMBER OF TOURIST ARRIVALS IN INDIA FROM 2015 TO 2019 (IN MILLIONS)



MOST IMPORTANT COUNTRIES FROM WHERE THE TOURISTS COME



[Adapted from www.statista.com]

Downloaded from Stanmorephysics.com

Copyright reserved

KWAZULU-NATAL

Downloaded from Stanmorephysics.com

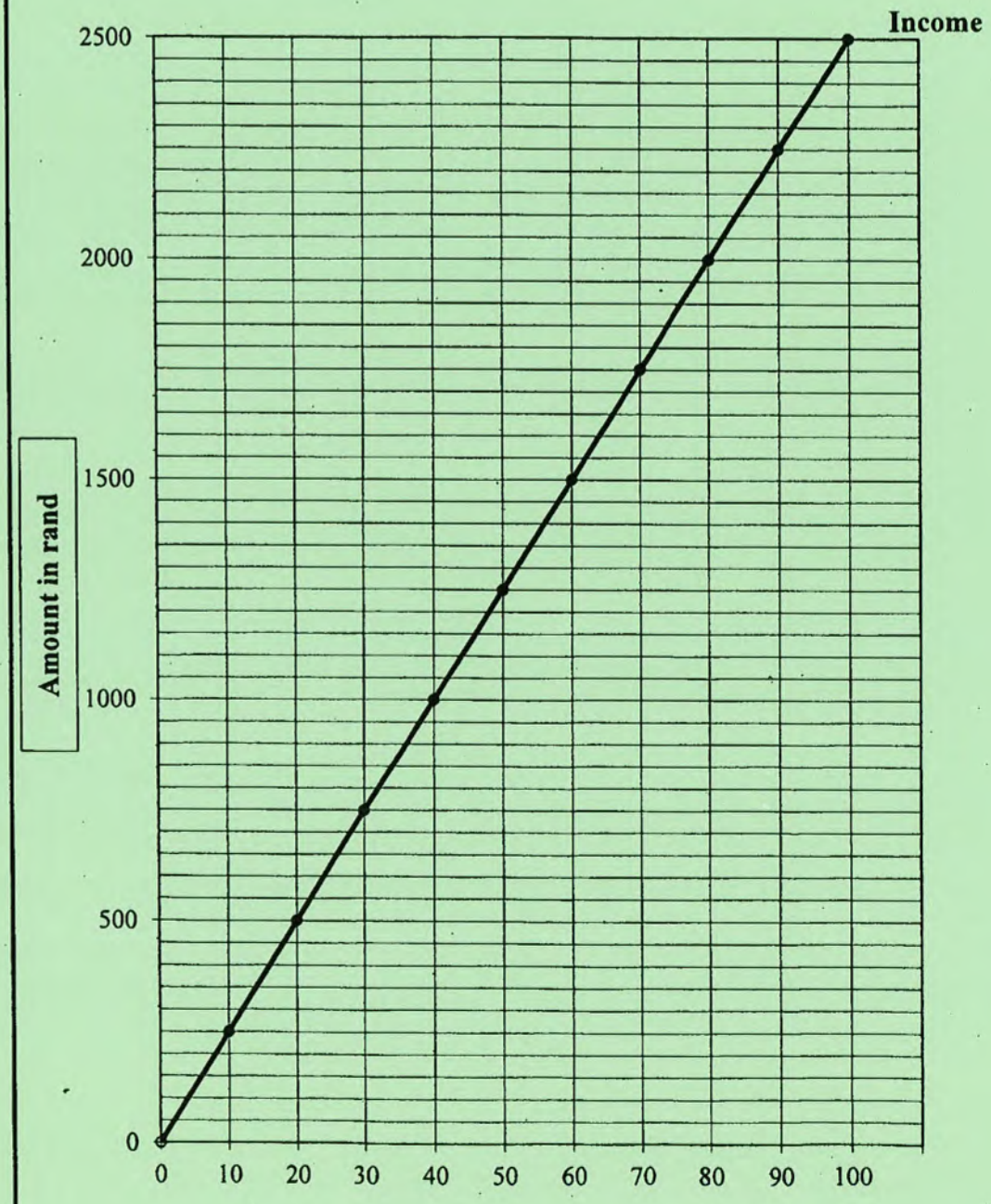
ANSWER SHEET

QUESTION 4.2.2

CENTRE NUMBER:

EXAMINATION NUMBER:

JANET'S BUSINESS GRAPH FOR PLATES OF BIRYANI



Copyright reserved