education

Department:
Education
PROVINCE OF KWAZULU-NATAL

# NATIONAL SENIOR CERTIFICATE

## GRADE 11

## MATHEMATICAL LITERACY

## COMMON TEST

## MARCH 2020

**MARKS: 100**

**TIME: 2 Hours**

**This question paper consists of 9 pages, 1 answer sheet and an addendum with 1 annexure.**

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## INSTRUCTIONS AND INFORMATION

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

2.
   2.1 Use ANNEXURE A in the ADDENDUM to answer QUESTION 1.1

   2.2 Answer QUESTION 3.6 on the attached ANSWER SHEET. Write your name and grade in the spaces on the ANSWER SHEET. 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. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.

6. Show ALL calculations clearly.

7. Round off ALL final answers appropriately according to the given context unless stated otherwise.

8. Units of measurement must be indicated where applicable.

9. Diagrams are not drawn to scale.

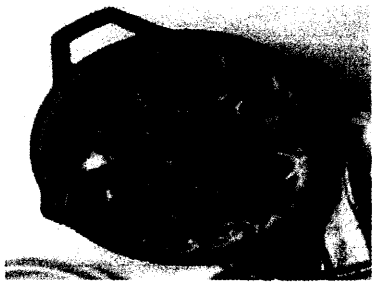
10. Write neatly and legibly.

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## QUESTION 1

1.1

Nelson stayed in Chicago for 10 years and came back to South Africa in 2019. His favourite pizza while in America was the Chicago Style Deep Dish Pizza. He decided to open his own pizza outlet, selling the Chicago Style Deep Dish Pizza baked in a cast-iron skillet.



In America they use the Imperial System. The recipe and some of the conversions are given in ANNEXURE A.

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

1.1.1 Calculate, in millilitres, the combined quantity of garlic powder, dried oregano, dried basil and pepper needed for the recipe on ANNEXURE A. (2)

1.1.2 Nelson has an order for 50 pizzas. Calculate the quantity of sliced mushrooms, in pounds, needed if the given recipe on ANNEXURE A makes 2 pizzas. (2)

1.1.3 Calculate the amount, in kilograms, of all-purpose flour needed for the order Mentioned in **1.1.2**. (4)

1.1.4 Chicago Style Deep Dish Pizza bakes well in an iron-cast baking tin and the oven must be pre-heated to 450°F. Convert the temperature to °C Round off your answer to the nearest whole number.

You may use the formula: $°\mathbf{C}=(°\mathbf{F}-\mathbf{32})\div\mathbf{1,8}$ (3)

1.1.5 Nelson uses a double deck oven and each oven can take a maximum of 4 iron-cast baking tins. If Nelson starts baking the pizzas for his order at 7:15 a.m., giving an allowance of 7 minutes to put the new dough in the trays, at what time will he finish baking the 50 pizzas excluding the preparation and rising time? (7)

1.2

Anele is employed by Nelson to assist him with baking pizzas. She contributes 7, 5% of her basic salary to a Pension Fund Scheme. UIF is 1% of the employee's gross income.

TABLE 1 below shows Anele's pay slip for January 2020.

**TABLE 1: PAYSLIP FOR JANUARY 2020**

| **COMPANY** | **PERIOD** | **EMPLOYEE NAME** |
|---|---|---|
| NELSON FOOD OUTLET<br>56 Nkoninga Road<br>Birdwood.<br>3900. | 31/01/2020 | ANELE ZONDI<br>ID Number: 9827030127080<br>Employment Number: C008 |

| **EARNINGS** | | **DEDUCTIONS** | |
|---|---|---|---|
| Description | Amount | Description | Amount |
| Basic Salary | 5 000,00 | PAYE Tax<br>UIF Contribution<br>Pension Fund | 0,00<br>50,00<br>**A** |
| **TOTAL EARNINGS** | 5 000,00 | **TOTAL DEDUCTIONS** | **B** |
| **NET PAY** | | | **C** |

Use the information above to answer the questions that follow.

1.2.1 Define "Net Pay". (2)

1.2.2 Write down Anele's employment number. (2)

1.2.3 Calculate the missing values **A, B** and **C**. (5)

1.3

Anele has a Standard bank Account. The cash deposit over the counter (branch deposit) services involves a ***basic fee of R8,50 plus R1,85 per R100 or part thereof, with a minimum charge of R43,00.***

1.3.1 What is the minimum amount that a person can be charged for a cash deposit over the counter? (2)

1.3.2 Anele deposits R3 250,00 over the counter at Standard Bank. Calculate the amount she will be charged. (4)

1.3.3 Anele was charged R75,10, calculate how much cash she deposited into her account. (5)

**[38]**

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## QUESTION 2

2.1

Great Hope is a private high school. In 2019 the school governing body prepared a budget for 2020 to be presented to the parents for their approval. TABLE 2 below shows the projected budget for 2020.

**TABLE 2: PROJECTED BUDGET FOR 2020**

| **INCOME (2020)** | | **EXPENDITURE (2020)** | |
|---|---|---|---|
| **Item** | **Amount (R)** | **Item** | **Amount (R)** |
| School Fees | 1 237 500 | Salaries (teachers, secretaries, ancillary staff) | 1 705 852 |
| Government Subsidy | 854 639 | Administration + Departmental Budgets | 180 100 |
| Donations | 20 000 | Municipality (electricity, water, refuse coll.) | 122 659 |
| Bad Debts Recovered | 4 512 | School Bus Insurance and Maintenance | 37 857 |
| Sundry income | 2 300 | Grounds Maintenance | 115 203 |
| Fund Raising | 34 821 | Text Books and Additional Stationery | 738 044 |
| Tuck Shop | 15 017 | Sports Department Budget | 86 900 |
| Stationery Fees | 350 000 | Sundry (miscellaneous) | 42 194 |
| Interest Received | 1 948 | Annual Prize Giving | 20 000 |
| | | Staff Professional Development | 15 000 |
| | | Staff End of Year Function | 10 000 |
| | | Computers Maintenance and Upgrade | 36 500 |
| | | Capital Expense | |
| | | | |
| | | **Total Expenditure** | **3 110 309** |
| **Total Income** | **2 520 737** | **Profit/Loss** | **-589 572** |

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

2.1.1 Define the term *"surplus"* in this context. (2)

2.1.2 Calculate the number of learners to be enrolled in 2020 if the school governing body wants a 10% increase in the 2019 fees, which was R1 500 per month. (4)

2.1.3 Explain the meaning of the negative sign (-) in the Profit/Loss amount. (2)

2.1.4 One parent in the Annual General Meeting (AGM) made a proposal that the fees for 2020 be increased to R2 500 to offset the deficit of R589 572. Verify with calculations, whether this proposal is valid. (4)

2.1.5 The school needs to buy a 16 Seater Quantum minibus for R412 900. The parents agreed to add this amount as a capital expense. Calculate the new deficit when parents agree to a fees increase of R2 500. (3)

2.1.6 Suggest ONE way of raising the minibus shortfall of R364 972 without further increasing school fees. (2)

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2.2 The Great Hope High School SGB Fundraising Committee decided to have a fundraising supper at the end of each month to try and raise R364 972 shortfall for the minibus. The school agreed to charge the committee R150 for using the school kitchen to prepare the food for sale. This amount is also used to pay for electricity. The committee estimated that it will cost R50 to prepare a plate of food including a glass of juice. Each meal will be sold for R100, including juice.

2.2.1 The formula for total cost is $\boldsymbol{Total\ Cost = R150 + R50n}$, where $\boldsymbol{n}$ is the total number of plates of food.

Write down the formula for total income.

$\boldsymbol{Total\ Income = \cdots}$ (2)

2.2.2 The fundraising committee started their fundraising in January, and claim that the total amount the committee will be able to raise by the end of December 2020 will be more than R120 000 if an average of 200 meals are sold every month. Use calculations to verify the fundraising committee's claim.

You may use the formula: $\boldsymbol{Profit = Total\ Income - Total\ Cost}$. (7)

2.2.3 Use calculations to show that it will take the committee 37 months to raise the minibus shortfall of R364 972. (3)

**[29]**

## QUESTION 3

Nelson who lives in Umhlathuze District Municipality uses the table below to determine residential Electricity consumption charges.

**TABLE 3: RESIDENTIAL ELECTRICITY CONSUMPTION CHARGES**

| Block | Range (kWh) | Charge/kWh (Excl. VAT) | Charge/kWh (Incl. VAT) |
|---|---|---|---|
| 1 | 0 – 50 | 0,7298 | 0,8393 |
| 2 | 51 – 350 | 0,9373 | 1,0779 |
| 3 | 351 – 600 | 1,3349 | 1,5351 |
| 4 | 601 – 1 500 | 1,3961 | 1,6055 |
| 5 | >1 500 | 1,5931 | 1,8321 |

**Source: [www.umhlathuze.gov.za]**

**NOTE:** VAT is 15%.

Use the information above to answer the questions that follow.

3.1 Explain the term "*tariff*". (2)

3.2 Show how the tariff rate of R0,8393 per kWh was calculated. (2)

3.3 Nelson used 278 kWh of electricity. Calculate what he was charged excluding VAT. (3)

3.4 End of January 2020 Nelson paid R781,96 including VAT. Calculate the amount of electricity consumed. (7)

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3.5 Why did Eskom introduce the inclined block tariff (IBT) or sliding scale system for domestic electricity charges? (2)

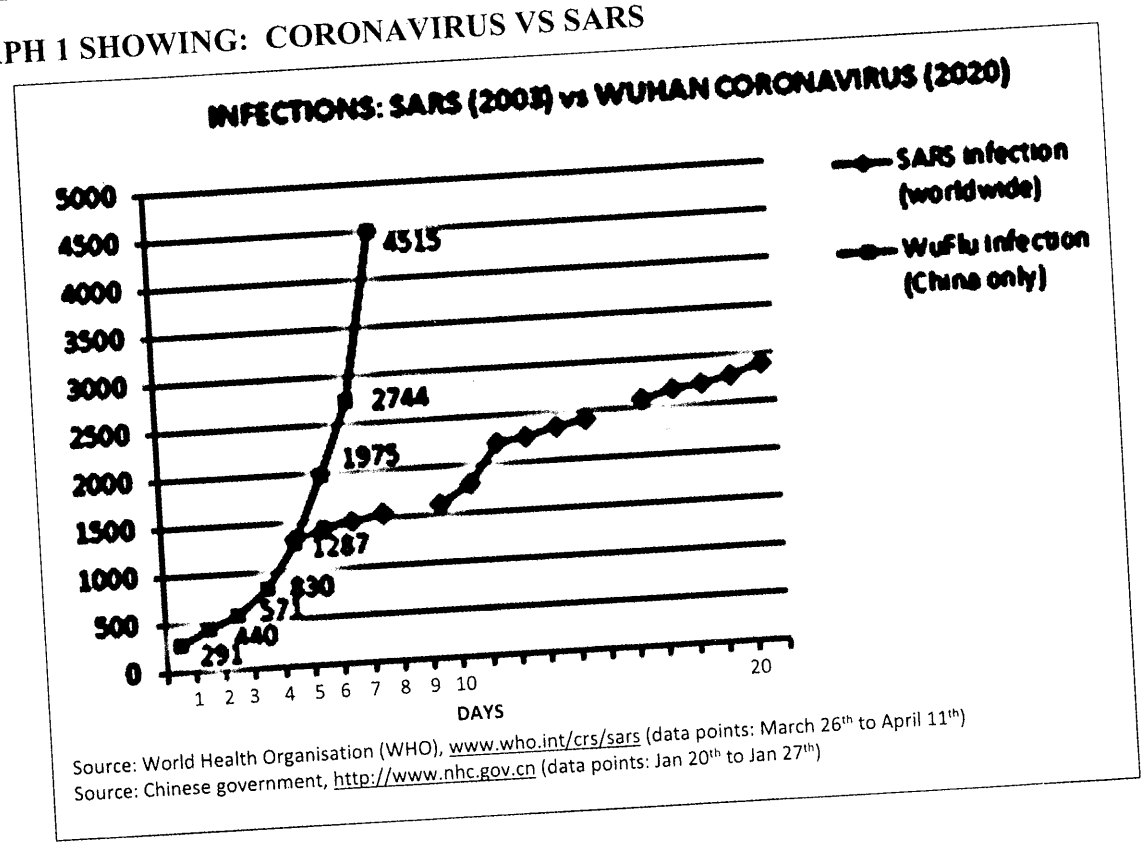
3.6 Use the tariff rates (including VAT) and sketch the stepped graph representing uMhlathuze Municipality residential electricity charge tariffs on the ANSWER SHEET provided. (5)
**[21]**

## QUESTION 4

4.1 Coronavirus is a large family of viruses that cause illness ranging from the common cold to more severe diseases. Coronavirus infections seem to be sky rocketing at an alarming rate. The graph below compares the coronavirus infection rate (2020) with the SARS (a coronavirus that broke out in wet market) infection rate (2003). Both viruses originated in China.

Source: https://www.who.int>health-topics

**GRAPH 1 SHOWING: CORONAVIRUS VS SARS**




Source: World Health Organisation (WHO), www.who.int/crs/sars (data points: March 26th to April 11th)
Source: Chinese government, http://www.nhc.gov.cn (data points: Jan 20th to Jan 27th)

Use the graph above to answer the following questions.

4.1.1 What type of relationship is presented by GRAPH 1 above? Write down ONLY the letter of the correct relationship.

A: constant ratio relationship.

B: combination of relationship.

C: relationship for which there is no obvious patterns or for which the relationships arise out of engagement with a problem in context. (2)



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4.1.2 Which graph represents data from the World Health Organisation? (2)

4.1.3 Calculate the percentage increase for WuFlu for the first 8 days, to ONE decimal place.

You may use the formula:

$$\textbf{Percentage increase} = \frac{\text{Day 8 infections} - \text{Day 1 infections}}{\text{Day 1 infections}} \times 100\%$$

4.1.4 Give ONE possible reason why there are gaps on the graph for SARS virus infection. (4)

4.1.5 Comparing the steepness of the two graphs, what conclusion can you draw about the infection rates of the two viruses? (2)

(2)
**[12]**

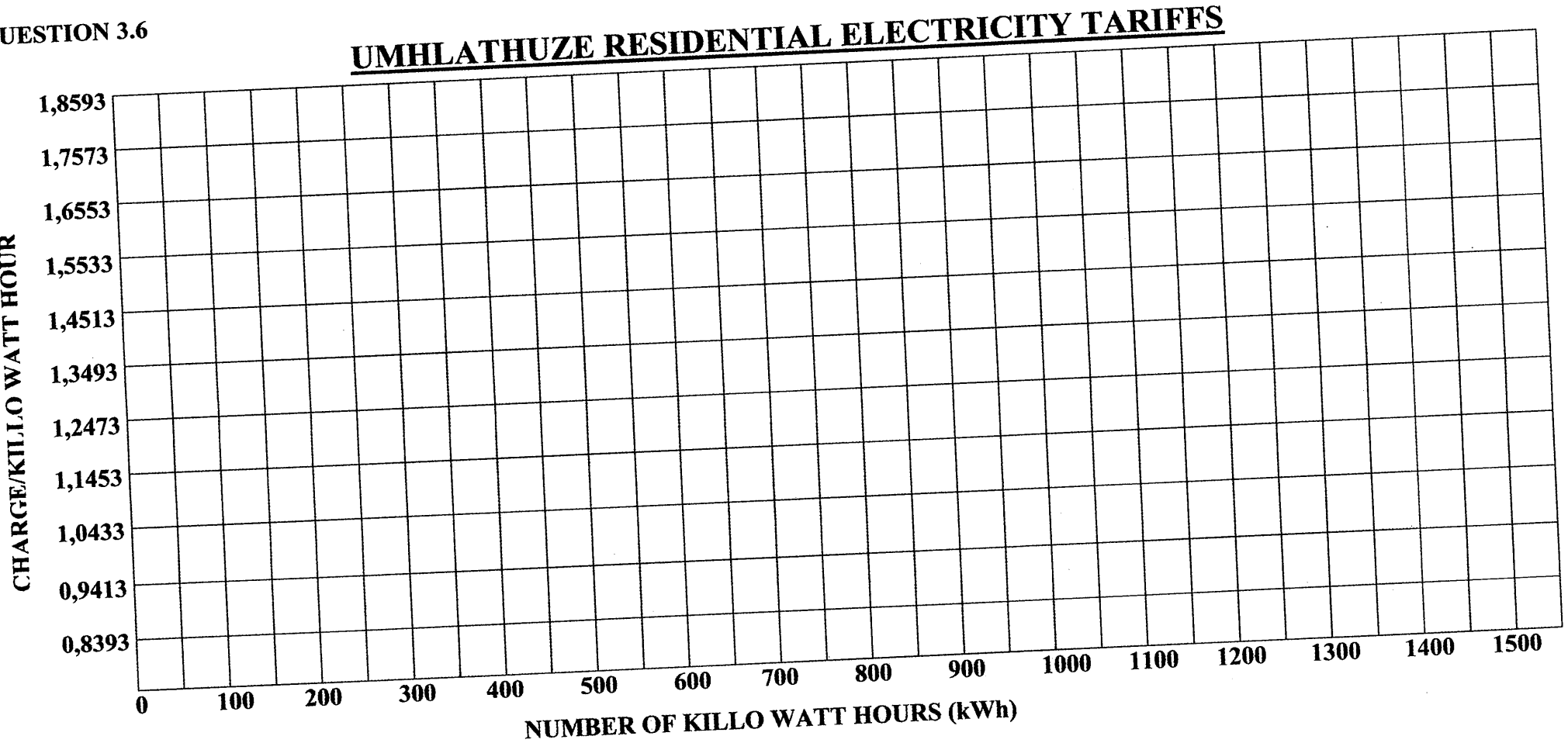
**TOTAL: 100**

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# ANSWER SHEET

**NAME:** _____ **GRADE:** _____

**QUESTION 3.6**




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## ADDENDUM

## MARCH 2020

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**GRADE 11**

**This addendum consists of 2 pages.**

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**ADDENDUM**

# ANNEXURE A

**Question 1.1**

| RECIPE FOR CHICAGO STYLE REGULAR PIZZA | |
|---|---|
| **BASIC PIZZA DOUGH**<br>$3\frac{1}{2}$ *cups all purpose flour*<br>$\frac{1}{4}$ *cup cornmeal*<br>1 *package* $\left(\frac{1}{4}\right.$ *ounce*$\left.\right)$ *quick rice yeast*<br>$1\frac{1}{2}$ *teaspoons sugar*<br>$\frac{1}{2}$ *teaspoon salt*<br>1 *cup water*<br>$\frac{1}{3}$ *cup olive oil* | **TOPPINGS**<br>6 *cups shredded part skim mozzarella cheese*<br>1 *can* (28 *ounces*) *decided tomatoes, well drained*<br>1 *can* (8 *ounces*) *tomato sauce*<br>1 *can* (6 *ounces*) *tomato paste*<br>$\frac{1}{2}$ *teaspoon salt*<br>$\frac{1}{4}$ *teaspoon each* (*garlic powder, dried oregano, dried basil and pepper*)<br>1 *pound bulk Italian sausage, cooked and crumbled*<br>48 *slices pepperoni*<br>$\frac{1}{2}$ *pound sliced fresh mushrooms*<br>$\frac{1}{4}$ *cup grated Parmesan cheese* |
| **CONVERSIONS**<br>1 *pound* = 453,59 *grams*<br>1 *ounce* = 28,35 *grams* | **CONVERSION FACTORS**<br>1 *cup* $(c) = 250ml = 17tbsp = 50tsp$<br>1 *cup* (*all purpose flour*) $= 150g$<br>1 *tablespoon* $(tbsp) = 15ml = 3tsp$<br>1 *teaspoon* $(tsp) = 5ml = \frac{1}{3}tbsp$ |
| **PREPARATION TIME AND BAKING TIME**<br>*Preparation* + *Rising*: 20 *minutes*<br>*Baking*: 40 *minutes*<br>**N.B: THE RECIPE MAKES 2 REGULAR CHICAGO-STYLE DEEP DISH PIZZAS** | |

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# MARCH COMMON TEST 2020

## GRADE 11

**MARKS: 100**

| Symbol | Explanation |
|---|---|
| M | Method |
| M/A | Method with Accuracy |
| CA | Consistent Accuracy |
| A | Accuracy (Answer) |
| AO | Answer only full marks |
| C | Conversion |
| S | Simplification |
| RT / RG / RM/RP | Reading from table / Reading from graph / Reading from map/Reading from plan |
| F | Choosing the correct formula |
| E | Explanation/Comment |
| D | Correct definition |
| SF | Substitution in formula |
| O | Opinion |
| J | Justification |
| P | Penalty e.g. for no units, incorrect rounding, etc |
| R | Rounding off / Reason |

This marking guideline consist of 7 pages.

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| **QUESTION 1** | | | |
|---|---|---|---|
| Q | Solution | Explanation | T&L |
| 1.1.1 | Number of millilitres $= \frac{1}{4}(5+5+5+5)$✓M<br>$= 5ml$✓A | 1M multiplying 20 by 1/4<br>1A correct answer<br>(2) | M<br>L1 |
| 1.1.2 | $\frac{1}{2}$ pound for 2 pizzas<br>50 pizzas $= \frac{25}{2}$ pounds✓M<br>$= 12{,}5$✓A | 1M for dividing 25 by 2<br>1A correct answer<br>(2) | M<br>L1 |
| 1.1.3 | 50 pizzas: $3{,}5 \times 25 = 87{,}5$ pounds✓M<br>$= \frac{87{,}5\times 453{,}59\text{✓M}}{1\,000\text{✓M}}$<br>$= 39{,}69\ kg$✓C | 1M multiplying 3,5 by 25<br>1M multiplying by 453,59<br>1M for dividing by 1000<br>1C correct conversion<br>(4) | M<br>L2 |
| 1.1.4 | Temperature $= (450-32) \div 1{,}8$✓SF<br>$= 232{,}22$℃✓C<br>= 232℃✓ R | 1SF correct substitution<br>1CA correct answer<br>1R Correct rounding<br>(3) | M<br>L2 |
| 1.1.5 | Times trays will put in the oven $= 50 \div 4$✓M<br>$= 13$✓R<br>Total preparation + baking time $= 13 \times 47$✓M<br>= 611 min ✓A<br>$611 \div 60 = 10$hrs 11 minutes✓C<br>Finishing time $= 7{:}15 + 10$hrs 11 min ✓M<br>= 17 :26 OR 5:26 pm ✓CA | 1M dividing by 4<br>1R rounding off<br>1M multiplying 13 by 47<br>1A correct answer<br>1C correct conversion<br>1M addition<br>1CA correct time<br>(7) | M<br><br>L4<br>2 |
| 1.2.1 | Net salary is the amount Anele received after major deductions. ✓✓D | 2D correct definition<br>(2) | F<br>L1 |
| 1.2.2 | C = 008 ✓✓ RT | 2RT correct employment number<br>(2) | F<br>L1 |

| Q | Solution | Explanation | T&L |
|---|---|---|---|
| 1.2.3 | $A = 7{,}5\%$ of R5 000✓M<br>$= R375{,}00$✓A<br><br>$B = R50{,}00 + R375{,}00$<br>$= R425{,}00$✓A<br><br>$C = R5\,000 - R425$✓M<br>$= R4\,575$✓A | 1M multiply by 7,5%<br>1A the correct value of A<br><br>1A correct value of B<br><br>1M subtracting 425 from 5000<br>1A correct value of D<br>(5) | F<br><br><br>L2 |

| | | | |
|---|---|---|---|
| 1.3.1 | R43,00✓✓A | 2A correct answer<br>(2) | F<br>L1 |
| 1.3.2 | R3 250 ÷ R1,85✓M = 32,5<br>≈ 33✓R<br>Charge = R8,50 + R1,85(33)✓M<br>= R69,55✓CA | 1M for dividing by R1,85<br>1R for rounding off 32,5<br>1M multiplying by 33<br>1CA correct answer/accuracy<br>(4) | F<br>L2 |
| 1.3.3 | R75,10 − R8,50✓M<br>= 66,60 ÷ 1,85 ✓M<br>= 36✓A × 100 ✓M<br>= R3 600 ✓CA | 1M subtracting R8,50 from R75,10<br>1M Diving by 1,85<br>1A correct answer<br>1M Multiplying by 100<br>1CA correct answer<br>(5) | F<br>L3 |
| | | | **[38]** |

| **QUESTION 2** | | | |
|---|---|---|---|
| 2.1.1 | The amount of money left over when all payment have been made. ✓✓D | 2D Correct definition<br>(2) | F<br>L1 |
| 2.1.2 | New fees = 110% × R1 500✓M<br>= R1 650✓A<br>Expected number of learners = $\frac{\text{R1 237 500}}{\text{R1 650}\checkmark\text{M}}$<br>= 750✓CA | 1M multiplying by 110%<br>1A for the new fees<br><br>1M dividing by 1 650<br>1CA correct answer/accuracy<br>(4) | F<br><br><br><br>L3 |
| 2.1.3 | deficit or loss✓✓D | 2D correct definition<br>(2) | F<br>L1 |
| 2.1.4 | (R2 500 – R1 650✓M = R 850)<br><br>Total IncomeR2 520 737 + R850(750)✓M<br>= R3 158 237✓A<br>R3 158 237 > *R*3 110 309<br>The parent's proposal is correct. ✓O | 1M subtracting 1650 from 2500<br>1M multiplying 850 by 750<br>1A answer<br>1O correct verification<br>(4) | F<br>L4 |

| Q | Solution | Explanation | T&L |
|---|---|---|---|
| 2.1.5 | Total Expenditure $= R3\ 110\ 309 + R412\ 900$✓M<br>$= R3\ 523\ 209$✓A<br>Deficit $= R364\ 972$✓A | 1M addition<br>1A total expenditure<br>1A correct answer<br>(3) | F<br>L2 |
| 2.1.6 | Asking for donations from well wishers. ✓✓O<br>**OR**<br>More fundraising activities by the SGB and learners. ✓✓O | 2O any good suggestion<br><br>2O any good suggestion<br>(2) | F<br>L4 |
| 2.2.1 | Total Income $= R100n$✓✓A | 2A for the correct formula.<br>(2) | F<br>L2 |
| 2.2.2 | Total Cost $= R50 \times 200 \times 12$✓M<br>$= R120\ 000$✓A<br>Total Income $= R100 \times 200 \times 12$✓M<br>$= R240\ 000$✓A<br>Profit $= R240\ 000 - R120\ 000$✓M<br>$= R120\ 000$✓CA<br>Claim is not true. ✓O | 1M multiplying 50 by 200 by 12<br>1A total cost<br>1M multiplying 100 by 200 by 12<br>1A for total income<br>1M for the difference<br>1CA answer/accuracy<br>1O correct conclusion<br>(7) | F<br>L4 |
| 2.3.3 | Profit/month $= R10\ 000$✓M<br>Number of months $= R364\ 972 \div R10\ 000$✓M<br>$= 36{,}5$✓A<br>$\approx 37$ months | 1M for R10 000<br>1M dividing 364 972 by 10 000<br>1A correct answer<br>(3) | F<br>L2 |
| | | | **[29]** |

| **QUESTION 3 [21 MARKS]** | | | |
|---|---|---|---|
| 3.1 | It is the rate of charge per kWh. ✓✓D | 2D correct definition<br>(2) | F<br>L1 |
| 3.2 | Rate including VAT $= R0{,}7298 \times 1{,}15$✓M<br>$= R0{,}8393$✓A | 1M multiplying by 1,15<br>1A answer<br>(2) | F<br>L2<br>F<br>S2 |
| 3.3 | Charge $= 50(R0{,}7298)$✓M $+ 228(R0{,}9373)$✓M<br>$= R250{,}19$✓CA | 1M for multiplying 50 by 0,7298<br>1M for multiplying 228 by 0,9373<br>1CA Correct answer<br>(3) | F<br>L2 |

| Q | Solution | Explanation | T&L |
|---|---|---|---|
| 3.4 | $50(\text{R}0{,}8393) + 300(\text{R}1{,}0779)$✓M $250(\text{R}1{,}5351$✓M$)$<br>$= \text{R}749{,}11$<br>$\text{R}781{,}96 - \text{R}749{,}11 = \text{R}32{,}85$✓A<br>Usage in Block 4 $= \frac{\text{R}32{,}85}{\text{R}1{,}6055}$<br>$= 20{,}46$ kWh✓CA<br>Total usage $= 50 + 300 + 250 + 20{,}46$✓M<br>$= 620{,}46$ kWh✓A | 1M for multiplying by 300<br>1M for multiplying by 250<br>1A Correct answer<br><br>1M dividing 32,85 by 1,6055<br>1CA answer/accuracy<br>1M adding correct values<br>1A correct answer<br>(7) | F<br>L3 |
| 3.5 | To discourage people from reckless or careless use of electricity. The greater the usage, the more the consumer pays. ✓✓ O | 1O correct reason<br>(2) | F<br>L4 |
| 3.6 | Graph sheet. ✓✓✓✓✓A | 1A for each correct line segment<br>(5) | F<br>L2 |
| | | | **[21]** |

| **QUESTION 4[12 MARKS]** | | | |
|---|---|---|---|
| Q | Solution | Explanation | T&L |
| 4.2.1 | (c) ✓A because values do not increase at a constant ratio or constant rate. ✓J | 1A for correct answer<br>1J correct reason<br>(2) | P&R<br>L4 |
| 4.2.2 | SARS infection graph. ✓✓A | 2A for correct answer<br>(2) | P&R<br>L1 |
| 4.2.3 | Percentage Increase $= \frac{4\,515 - 291\text{✓SF}}{291\text{✓M}} \times 100\%$<br>$= 1\,451{,}55\%$✓A<br>= 1 451.6 % ✓R | 1SF correct substitution<br>1M dividing by 291<br>1A correct answer<br>1 R correct rounding<br>(4) | P&R<br>L2 |
| 4.2.4 | Information not reported or data not available. ✓✓J | 2J correct reason/justification<br>(2) | P&R<br>L4 |
| 4.2.5 | Coronavirus infection rate is very high compared to the infection rate by SARS. ✓✓RG | 2RG correct reading from graph<br>(2) | P&R<br>L4 |
| | | | **[12]** |

**TOTAL: 100**

**MEMO – QUESTION 3.6**

