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**QUALITATIVE ANALYSIS OF LEARNER RESPONSES AND EVALUATION OF QUESTION PAPERS: NSC 2021**

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| **REPORT 1: EVALUATION OF THE QUESTION PAPER AND MARKING GUIDELINE** |

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| **SUBJECT** | **MATHEMATICAL LITERACY** |
| **PAPER** | **1** |
| **DURATION OF PAPER:** | **3 HOURS** |

**SECTION 1: (General overview of Candidate Performance in the question paper as a whole)**

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|  | The paper was fair, but candidates happen to answer it poorly for it is 52% overall pass as from the Rasch sample of 100 scripts.  This a sample of 100 scripts out of about 49 678 scripts and may not be a true reflection the population. However, it gives a good insight on the performance especially the details about the questions. If the sample is to be represent performance of the 2021 candidates in Mathematical Literacy P1, then the results for the province in Mathematical Literacy may not be good. |
|  | The performance of the candidates in various questions as from the same sample indicate the following passes.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Question | 1 | 2 | 3 | 4 | 5 | Overall | | %Pass | 60 | 56 | 46 | 44 | 56 | 52 | |
|  | The graph indicating the above results is sketched below. |
|  | The performance of the sample according to levels is also shown by the graph below graph   |  | | --- | |  | |
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| **SECTION 2: Comment on candidates’ performance in individual questions (It is expected that a comment will be provided for each question).** | | |
| **QUESTION 1** | | |
| **(a)** | **General comment on the performance of candidates in the specific questions. Were the questions well answered or poorly answered?** | |
|  | This is a fairly well answered question at 61% Pass based on the Rasch sample with the subsection 1.1 at 56%, 1.2 at 67% and 1,3 at 57%l. See the graph below. | |
|  | Performance for Q1 is shown below:     |  | | --- | |  | | |
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| **(b)** | **Why was the question poorly answered? Also provide specific examples, indicate common errors committed by candidates in this question, and any misconceptions.** | |
|  | The findings from the marking process as to the mistakes candidates made are discussed below per sub-question**.** | |
|  | 1.1.1 | Though the question was well answered some candidates swoped the values and got negative value. Others calculated the percentage increase instead of price increase. |
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|  | 1.1.2 | Candidates failed to interpret the table correctly therefore failed to choose the correct exchange rate.  Candidates divided the fuel price by the exchange rate meaning they lack a skill on how to convert the exchange rate. The sample shows that 93% failed this 1.1.2 and got 0 marks! |
|  | 1.1.3. | Candidates failed to compare decimal numbers and are unable to differentiate between to and from. Some candidates could not understand the question in terms of decrease in the fuel price as a result they scored 1mark out of 2. |
|  | 1.1.4. | Candidates still confuse ascending and descending order, and they also struggle working with decimals. Candidates showed no knowledge of decimal numbers and their values especially when the data have both 2decimal digits and 3 decimal digits. |
|  | 1.1.5. | Candidates still struggle with rounding. They rounded incorrectly and assumed that 3 decimal places meant there should be three digits on an answer, e.g., 0,83 instead of 0.833 |
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| 1.2 | 1.2.1. | Reading from a graph is a problem. Graph skills remain a challenge to many especially use of scale. |
|  | 1.2.2. | Mostly answered correctly. |
|  | 1.2.3 | Candidates are failing to convert from cents to rands, and also fail to do rounding and cannot link previous answers to current question. |
|  | 1.2.4. | The candidates answered according to their experiences, the mentioned **word** something that they not usually use even though it was on the graph. Candidates fail to interpret the graphs. |
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| 1.3 | 1.3.1 | Mostly answered correctly though others answered according to their own understanding. |
|  | 1.3.2. | Candidates are not well taught the data cycle seemingly they know analysis more than any other parts. |
|  | | |
| **(c)** | **Provide suggestions for improvement in relation to Teaching and Learning.** | |
|  | Teachers must use CAPS document to guide them so that they teach candidates correctly and cover all parts of the topic. | |
|  | Share exam guidelines with the candidates so that they will know how to define terms used in a topic, write acronyms and all other relevant information. | |
|  | When introducing a topic, a teacher should thoroughly give definitions e.g., VAT stands for Value Added Tax. | |
|  | More written work should be given to candidates so that they will identify their mistakes and rectify them. | |
|  | Teachers must make sure they teach concept of rounding in contexts. Teaching candidates Data Handling should be done thoroughly including the process and not only summary. There is need to teach Candidates the skills of drawing and interpretation of graphs in various topics and contexts. The emphasis of using scale is fundamental and cannot be over-emphasised. | |

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| **(d)** | **Describe any other specific observations relating to responses of candidates** |
|  | Educators should train their candidates to analyse the given extracts or tables or graphs well to use the correct information required by the question. This will prevent misunderstanding the questions. |
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| **(e)** | **Any other comments useful to teachers, subject advisors and teacher development.** |
|  | To develop workshop materials to use when training teachers in Data Handling.  More emphasis should be on conversion, rounding off and decimal numbers(values) |
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| **QUESTION 2** | | |
| **(a)** | **General comment in the performance of candidates in Question 2. Was the question well answered or poorly answered?** | |
|  | The Question was generally well answered and from the sample, the performance indicates 60%. The performance in sub-questions from same sample indicate 59% in 2.1 and 61% in 2.2. It was a question testing Finance that covers 60±5% of the of the paper. Candidates must be taught well in Finance to pass Paper 1.     |  | | --- | |  | | |
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| **(b)** | **Why was the question poorly answered? Also provide specific examples, indicate common errors committed by candidates in this question, and any misconceptions.** | |
| 2.1 | Despite the performance being good in this question, there are errors picked up during the marking. They are pointed out per sub-question.  Language remains a challenge to most candidates whose English is a second language. This is reflected in Candidate’s lack of understanding of questions or scenario. | |
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|  | 2.1.1. | There were cases where some candidates wrote wrong response: e.g., online payment, EF and percentage execution that are unrelated to the question.  There were 2 options in the table cash and Hire Purchase. Candidates could not state the type of payment. |
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|  | 2.1.2 | Some candidates could not calculate the percentages to get the value of the deposit on Ford Figo.  Some candidates were adding instead of multiplying 5% of R215 100.  Some calculated 15% of the cash price of Ford Figo. |
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|  | 2.1.3 | A good number of Candidates still struggle to simplify a ratio.  Many candidates got 72:48 correct but got simplification wrong. They could not get 3:2!  Others do not know the order of the wanted ratio and gave 48:72. |
|  | 2.1.4 | Poorly answered  Many candidates had no idea what “**cost effective**” meant.  A good number of candidates answered VW Polo, thinking cost effective meant more expensive. |
|  | 2.1.5. | Was poorly executed. Candidate lacked understanding substitution into a given formula. It was an indication of lack of understanding Hire Purchase.  Most candidates used only ONE instalment instead of multiplying by 47 months. |
|  | 2.1.6. | Candidate became confused about calculating compound interest from year 1 to year 2 using the principal amounts and rate also using CA marking. |
|  | 2.1.4 | Language barrier: with confusing the terminology e.g. (more cost effective) and candidates focused on more cost effective. Therefore, candidates identified the VW Polo as more effective. |
| 2.2 |  |  |
|  | 2.2.1 | Candidates were confused with the number of contracts vs. the telephone number. |
|  | 2.2.2 | It was a question that required understanding the invoice. It was well answered since it involved choosing. Candidates were able to choose the required most expensive device. |
| 2.2 | 2.2.3. | Some candidates calculated VAT on VAT, |
|  | 2.2.4 | This question required to use answer obtained from the previous question. Candidates failed to link the current question with information obtained in 2.2.3 |
|  | 2.2.5. | Many candidates could not write probability in words. The answers expected included Impossible or Zero out of three, Zero percent or no chance |
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| **(c)** | **Provide suggestions for improvement in relation to Teaching and Learning** | |
|  |  | Candidate should be prepared by teachers about the new format of paper 1, expecting L1 – L4 questions. |
|  |  | Learners should be taught terminologies in context. |
|  |  | Using different textbooks, find more resources. |
|  |  | Teachers should be able to allow the consistent teaching from grade 10 – 12. |
|  |  | Using old fashion/ learning with multiplication and division of numbers. |
|  |  | Teachers should make sure that candidates are able to read more large numbers i.e., number and space separation. Teachers should teach the candidates to learn the subject of the formula also doing inverse calculations and calculating VAT when VAT is included and calculating values excluding VAT, when to divide by 1,15 or multiply by 1,15. |
|  |  | Teachers should encourage candidates to use and understand the use of different calculators, especially basic calculators with method. |

**QUESTION 3**

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| (a) | **General comment in the performance of candidates in the specific question. Was the question well answered or poorly answered?** | |
|  |  | The question performed at 50% as from the sample. It was a question examining Data Handling and Probability. It had a lot of reading with understanding and that explains one main reason of poor performance in the question especially in 3.1.  The graph below shows the performance in 3.1 1and 3.2 which was 40% and 70% respectively as from Rasch sample.   |  | | --- | |  | |
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| **(b)** | **Why the questions poorly answered? Also provide specific examples, indicate common errors committed by candidates in this question, and any misconceptions.** | |
| 3 | The sections that follow points out findings from marking as to the errors candidates made in the question**.** | |
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| 3.1 | 3.1.1 | Most candidates did not interpret the information in the question well.  Common errors include writing the wrong date of the 5 April 2021 instead of the correct date of 29 March 2021.  Some candidates also ignored the year of “2021” and only wrote “29 March”.  Some candidates wrote only 29. |
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|  | 3.1.2 | Error on 3.1.2.  million was omitted on writing 128 in words  While some candidates involved NET FSC millions which resulted on **one hundred and twenty-eight net FSC million cubic meters**  Wrong units were used: instead of cubic meters, metre squared was written  Omission of the importance of writing one resulted on candidates writing **hundred and twenty-eight million cubic meters.**  Others wrote one hundred twenty-eight !! |
|  | 3.1.3 | A question well answered, almost all the candidates got it right. Candidates were able to identify the province with lowest dam level. |
|  | 3.1.4 | Surprisingly this subsection was poorly answered.  The question was misinterpreted and/or rather treated as highest percentage which lead to the answer of: GAUTENG/ NC |
|  | 3.1.5 | Most candidates struggled in this sub- question trying to get the value of D.  It was one of most failed question although it tested the concept of mean but pitched at cognitive level 3.  Another common error is in question 3.1.5, where most candidates could not substitute the two D’s and the given mean to solve for D at the end.  Only few candidates understood the concept of the mean and its application and got it right. Simplification, answers without proper calculations were provided, trial and error/ reverse method was used by many candidates  D= 55  Examples of some wrong solutions presented by the candidates.  =83  Therefore: D= 55  Most candidates failed to use the second D, but was acknowledged on the denominator:  2nd scenario |
| Some of the candidates, without any calculations, randomly choose D = 55 and D = 52, as they were the values available around D in the question paper. |
|  | 3.1.6 | The concept of probability was failed to be explained and presented.  Fraction was not expressed, particularly ignored or not known.  Calculations proceeded to decimal and/or percentage format. Some expressed it as the ratio e.g.:  As the question sounded a bit vague to candidates, some candidates gave the solutions separately for |
|  | 3.1.7 | Most chose and multiplied with the correct percentage (%) but those that failed was because of omission of million and ended up with wrong solution shown below:  Some candidates failed to convert 15657millions to numerical value  , which resulted to  Other candidates chose a percentage in last week column % instead of choosing the value of 15657.  Some struggled to calculate percentage of big value in million. |
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| 3.2 | 3.2.1 | Some candidates chose values correctly but failed to use calculator.  Others swapped values during substitution  Candidates still struggle with interpretation of the percentage in context. When some got the percentage above 100%, they changed the answer. The answer was 152,94% and decided to make it 15,29%!  Some candidates rounded off wrongly: 152.9411764706  = 152.95%   |  |  | | --- | --- | | Some examples of wrong  solutions candidates gave. |  | |  | |  | |
|  | 3.2.2 | This sub question was well answered by the assumed urban areas candidates. There were some cases where some candidates presented no knowledge of shower, as low shower was treated as the shower placed on a lower position of the wall. |

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|  | 3.2.3 | Annexure was omitted/ignored by many candidates and then used statement in attempt to answer the question, of which they failed to continue to obtain the expected answers. and did not complete answering the question   |  |  | | --- | --- | | Wrong solutions from candidates include the following. |  | | The incorrect interpretation of the graph led to the wrong solutions. |  | |
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| **(c)** | **Provide suggestions for improvement in relation to Teaching and Learning** | |
|  |  | Educators must train the candidates to read the given information and preamble thoroughly before answering the questions. |
|  |  | Questions with tables and figures must be practiced more in the classroom to get candidates familiarised with these types of questions. |
|  |  | Educators must use English as a medium of teaching when explaining maths literacy questions, to enable candidates to get used to some key vocabulary in maths literacy and life in general since maths literacy questions are based on everyday life occurring’s. |
|  |  | Mathematical literacy Educators must attend memo discussions to present possible different candidates’ responses and approaches. These memo discussions develop teachers especially the novice teachers. |
|  |  | Candidates must be exposed to many different scenarios of different context both familiar and unfamiliar context. |
|  |  | Must go out of the box of grade 12 work, emphasise connectivity and/or integration of previous grades work versus the current grade’s work. |
|  |  | Candidates must be exposed to different type of questions in calculations of the mean, using the mean in calculation and as well same to be applied to other concept of data handling. |
|  |  | Educators must adapt on tactful reenforcing the concepts than drilling the concepts, so that the candidates could have an open mind on answering questions |
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| **(d)** | **Describe any other specific observations relating to responses of candidates and comments that are useful to teachers, subject advisors, teacher development etc.** | |
|  |  | Candidates must be made aware not to use the “%” on their calculators when they see “100%” but rather treat it as a unit and add it to their final answer at the end of their simplification. |
|  |  | Candidates must be reminded by educators that it is possible to get a percentage over 100%, like in Q3.2.1 (152.94%), and not panic and divide further by 100 to obtain 1,53 in which is wrong. |
|  |  | The “reason” question could be positioned as the last question for the sub-section, for example 3.2.3 instead of 3.2.2. this is because some candidates tend to stop after reasoning question. |
| **(e)** | **Any other comments useful to teachers, subject advisors and teacher development** | |
|  | Candidates must be taught that probability can be given only in 3 forms fraction, percentage, decimal, but can also expressed in words. | |
|  | Emphasise on issues of substitution the formulae to candidates is important.  Calculator use must be continuously practised.  Simplification must be practised where division, multiplication is applied (BODMAS)  Reading and analysis of tables, bar graphs, graphs must be thoroughly done  To familiarize the candidates with multi ways of representing data  To teach or rather revisit the writing of numbers in numerical from and in word form  And to write big numbers generally and accept them in scientific from | |

**QUESTION 4**

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| **Section 2: Comment on candidates’ performance in individual questions (It is expected that a comment will be provided for each question on a separate sheet).** | |
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| **(a)** | **General comment in the performance of candidates in the specific question. Was the question well answered or poorly answered?** |
|  | The performance in question was at 43% in 4.1, 45% in 4,2 and 46% in sub-question 4,3. This translated in 51% pass in question 4 being second last in the sample. The details of the errors as observed from the marking are explained below according to sub-questions.   |  | | --- | |  | |
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| Question 4 being the largest question in the paper with 35 marks out of which 13 marks allocated on level 4, 5 marks in level 3 and balance 17 marks.  This question was challenging for many candidates due to lack of understanding on basic conversions on mass, simple fractions to decimal fractions, exchange rates, cost calculations and formula substitutions. Plotting of straight-line graph using ruler was also found to be unknown to many. Only very fewer candidates obtained more than 20 marks in this question. | |
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| **(a)** | **Why the questions poorly answered? Also provide specific examples, indicate common errors committed by candidates in this question, and any misconceptions.** | |
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| 4.1 | 4.1.1. | BODMAS and conversion of units. Majority of candidates found to be confused to convert grams to kilograms or vice versa to calculate the cost. Expressing answer unit in terms of Rand instead of Rupees were found common among candidates resulted in losing mark. |
|  | 4.1.2. | Misunderstanding of amounts of ingredients for 8 plates and number of containers needed. Candidates found to be struggling in multistep calculations to obtain unit cost calculations. |
|  | 4.1.3. | Percentage project concept when the formula is not provided. Candidates were unable to calculate the profit and profit percentage to verify the claim and to substantiate. |
|  | 4.1.4. | Two-way exchange rate has confused the candidates. Candidates found to be confused on the operation on multiplication and division to obtain the price in another currency. |
| 4.2 | 4.2.1. | Method to solve a linear equation. Substituting correct values in the formulae and making the unknown as the subject to obtain answer remain in challenge for many. |
|  | 4.2.2. | Just carelessness, the table was complete. Many candidates have no idea on how to draw a straight-line graph and the necessity to use mathematical instrument ruler is alarming. Many candidates were not aware of plotting the points accurately on the scaled graph. |
|  | 4.2.3. | Candidates not able to analyse the question. It looks like the candidates got confused by not reading the question carefully to understand what the question demands. And, did not read the data from the clear table to answer this easy question. Most of the candidates wrote 10 plates instead of 50 plates. |
| 4.3. |  |  |
|  | 4.3.1. | Well, done by majority of candidates. However, converting simple fraction into a decimal fraction is challenging for some candidates. |
|  | 4.3.2. | More words were used to indicate the increase; (growing up, continuing up, growth, upward trend, etc.). Analysing and Interpreting graph was done majority of candidates, however the usage of terminology to express the trend shown varied. |
|  | 4.3.3. | Writing million as a number; working with big numbers still a challenge for many. Usage of unit million was not there in many cases and to write bigger number after obtaining the answer from calculation is also challenging for many candidates. |
|  | 4.3.4 | Disadvantages of rounding up/down to context. Logical answering is to be practiced by our candidates. Many candidates wrote 0.2% tourists were locals etc. |
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| **(c)** | **Provide suggestions for improvement in relation to Teaching and Learning** |
|  | Teachers to check the definition of the break-even point and explain to candidates the importance of reading before and after it. Candidates are to be trained to read and understand extract tables to answer questions in context. |
|  | doing more calculations on the pie chart; converting from angles to percentage and back, explaining where the total of 360º/100% could possible not be added. |
|  | doing more questions and emphasis on conversions and correct substitution. Candidates to be trained in all types of conversions both ways as well as the exchange rate calculations.  Need to emphasise the importance of usage of units at all levels in every calculation. |
|  | Teachers to practice candidates with formulae substitutions extensively with various subjects to drill them understanding the relationship of the formulations. |
|  | Explaining to candidates the importance of having their own calculators and timeously to practice its use. |
|  | Emphasis on the scale interval used in the grid so as to plot the points accurately. |
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| **(d)** | **Describe any other specific observations relating to responses of candidates and comments that are useful to teachers, subject advisors, teacher development etc.** |
|  | New educators must be trained by subject advisors with the latest NSC papers at various levels in line with the Chief marker’s reports published from time to time so as to fill the gaps in candidate attainment. |
|  | Special mention in addressing the logical questions and how to answer them to be emphasized with worked out exercises |
|  | Subject advisors and educators are urged to intervene with the latest model of questions and to use the CAPS document in aligning the exercises frame worked for using in classrooms |
|  | In the areas of candidates with language barriers to address with special attention in understanding the concepts and additional exercises to be used for the candidates to get familiar to adopt the situation. |
| **( e)** | **Any other comments useful to teachers, subject advisors and teacher development** |
|  | Subject advisors must moderate common / school framed assessments set by educators before administering so as to minimize the wide gap among common understanding on various issues highlighted above. |
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| **QUESTION 5** | | |
| **(a)** | **General comment in the performance of candidates in the specific question. Was the question well answered or poorly answered?** | |
|  | The question was poorly answered with the performance of candidates ranging from 65% 5.1 and 57% 5.2.   |  | | --- | |  | | |
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| **(b)** | **Why the questions poorly answered? Also provide specific examples, indicate common errors committed by candidates in this question, and any misconceptions.** | |
|  | 5.1.1. | Most of the candidates were unable to choose the correct tax bracket, they were not able to know that the taxable income given was for the whole year. Since they are used to be given monthly taxable income, they multiply that salary by 12 that led to a wrong tax bracket. |
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|  | 5.1.2. | Approximately 75% of the candidates were unable to substitute correctly in the formula. They were unable to simplify and working out with percentage (BODMAS). They were confused as to which rebate must be deducted for this question. |
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|  | 5.1.3. | This relates to the understanding of the rebates for they couldn’t relate the age and rebates for this person qualifies for both rebates, primary and secondary. Some of the candidates instead of subtracting rebate they added it. |
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|  | 5.1.4. | Candidates failed to understand the question to an extent that they multiplied the monthly medical contribution by twelve, for they know that it used to be subtracted as an annual amount from the annual income tax. |
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| 5.2. | 5.2.1. | (a) Candidates were not able to read and understand the box and whisker plot and hence answered the question for the brand they wish for.  (b) Candidates were unable to find the 50th percentile from the box and whisker plot due to lack of interpretation of it. |
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|  | 5.2.2. | Candidates confused the IQR with the range, hence most of them calculated the range instead of IQR. |
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|  | 5.2.3. | Candidates were unable to identify the quartiles from the box and whisker plot. |
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| **(c)** | **Provide suggestions for improvement in relation to Teaching and Learning.** | |
|  |  | Teachers must teach more of reading and interpretation of the box and whisker plot that to draw it. |
|  |  | Tax be taught in parts and combined it later. Taxable income, deductible allowances, rebates, medical credits and of cause choosing the correct bracket is key. |
|  |  | Workshops and Cluster groups to do HOW I teach to share skills and cover and content gap in some of the teacher. |
|  |  |  |
| **(d)** | **Describe any other specific observations relating to responses of candidates and comments that are useful to teachers, subject advisors, teacher development etc.** | |
|  |  | A good number of candidates added extra work which was wrong to the correct answer and now lost marks for that. |
|  |  | Most candidates switch values when substituting in the formula on question 5.1.2. 100 263 + 36% (423 300 – 551 762) instead of 100 263 + 36% (551 762 – 423 300), Candidates fail to understand that taxable income above is the difference amongst the amounts. |
| **(e)** | **Any other comments useful to teachers, subject advisors and teacher development.** | |
|  |  | Emphasis on simplification the use of BODMAS |
|  |  | More activities on income tax and box & whisker plot for they are the new topics to the candidates. |