## Province of the EASTERN CAPE EDUCATION

EXAMINATIONS AND ASSESSMENT CHIEF DIRECTORATE
Home of Examinations and Assessment, Zone 6, Zwelitsha, 5600
REPUBLIC OF SOUTH AFRICA, Website: www.ecdoe.gov.za

2018 NSC CHIEF MARKER'S REPORT

|	
SUBJECT:	INFORMATION TECHNOLOGY
PAPER:	1
DURATION OF PAPER:	3 HOURS
DATES OF MARKING:	1 DEC 2018 – 10 DEC 2018

SECTION 1: (General overview of Learner Performance in the question paper as a whole)
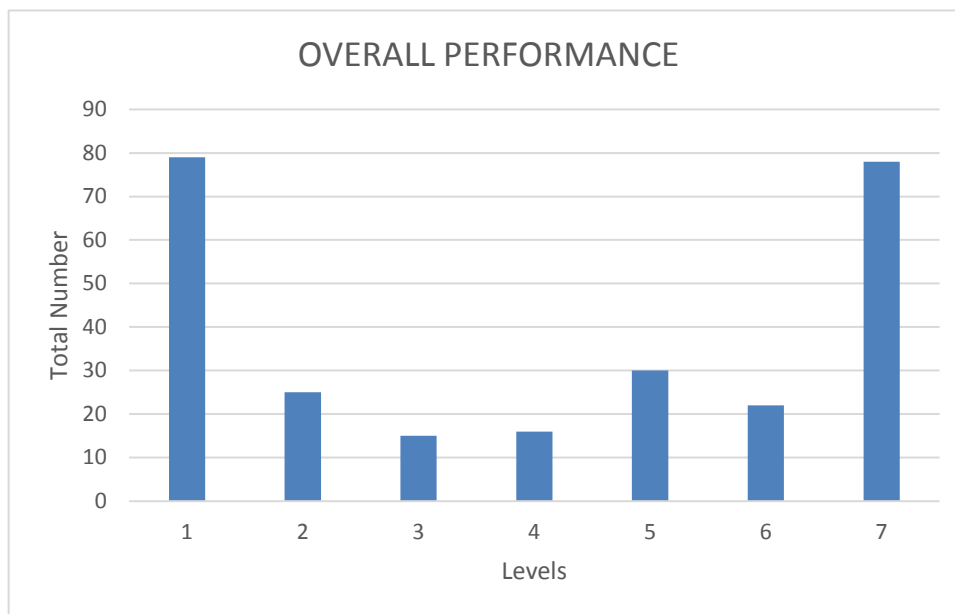
Learners' performance in this practical paper has increased. 79 of the 265 learners who wrote the paper achieved a level 7. Of the 79 learners, 5 learners achieved 100% and 36 learners achieved above 90%.

29% of all learners achieved level 1. This is an improvement from 2017 where 33% of all learners achieved level 1.

Learners attempted questions even if they were not sure how to solve the whole question.

building blocks for growth
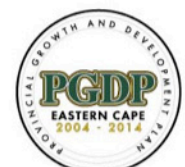
Ikamva eliqaqambileyo!

Marks are allocated for all correct code even if the program does not work.
Continued collaboration between schools and districts is important to achieve ongoing improvement in performance in this subject.

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).

QUESTION 1   Average mark: 67%
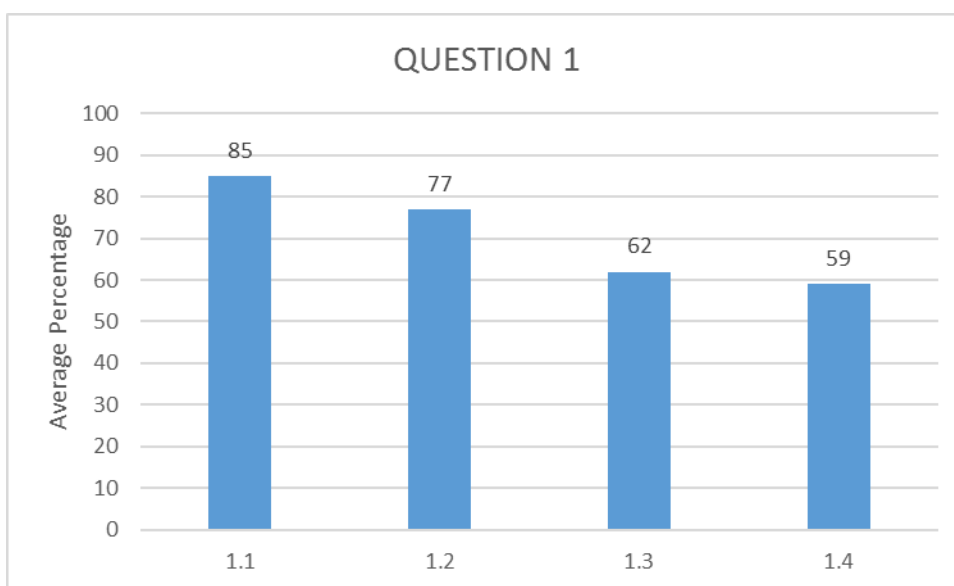
This was the easiest of all the questions and all learners should have been able to do well in this question.

QUESTION 1.1   Average mark: 85%

Topics Tested:

Output components, Component properties.

(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

This question was answered very well by most learners.

QUESTION 1.1

(b) Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Only a very few learners did not attempt this question.

Only a few learners made mistakes in this question.

For example:

pnlQ1_1.Color:=00; (The colour of the panel stays the same.) This is incorrect.

pnlQ1_1.Font.Color:=250; (The colour of the font is set to red.) This is correct.

pnlQ1_1.Color := 506020; (The colour of the panel stays the same.) This is incorrect.

pnlQ1_1.Font.Color := 005090; (The colour of the font is set to red.) This is correct.

QUESTION 1.1

(c)   Provide suggestions for improvement in relation to Teaching and Learning.

This question is at the level of grade 10, an introduction to programming. More practice with changing the properties of various components needs to take place in Grade 10 and revised in the following years.

QUESTION 1.2   Average mark: 77%

Topics Tested:

Input and output components, Built-in methods / Standard subroutines,

Mathematical problem solving.

(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

This question was answered well.

QUESTION 1.2

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Learners did not subtract 1 from the height in the calculation of the volume.

Most learners were able to display the volume (real number) correctly but many learners were unable to format a real number to 1 decimal point.

Because the calculation involves the value of PI, the volume had to be saved in a real data type variable. This was not done by many learners.

QUESTION 1.2

(c) **Provide suggestions for improvement in relation to Teaching and Learning.**

Learners could declare the height and radius as integers, but the volume had to be declared as a real number.

PI was allowed as the actual value, 3.14.

The square of the radius could be calculated as *rRadius*rRadius* or *Power(rRadius,2)* or *sqr(rRadius)*.

Any formatting to one decimal point was allowed, including using *floattostrf* and *roundto*.

rvolume := roundto(rvolume,-1): This is the correct use of *roundto* for this problem. Please note that -1 is used instead of 1. Learners could easily make this mistake.

QUESTION 1.3 Average mark: 62%

Topics Tested:

Input and Output components, String Handling, Decision making, Iteration, Standard subroutines, Mathematical problem solving

(a) **General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**

This question was answered relatively well.

QUESTION 1.3
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Obtaining a random number is always a problem for learners. The *randomrange* function works with the first parameter included in the range and the second parameter is one more than the top of the range.

Example:

To generate a random number from 5 to 50 with 5 and 50 both included:

RandomNumber := randomrange(5,51)

Or

RandomNumber := random(46) + 5

In this question an answer was allowed if the top value resulted in being either 51 or 49.

There were learners who did not know how to display numbered lines in a "*richedit".*

Learners did not increment a counter when finding a factor of the random number, but rather storing the factor itself into the counter variable.

There were many learners who forgot to count how many factors there were in the random number.

The number of factors had to be equal to 2, not less than or equal to 2, and learners used greater than or less than symbols which was incorrect.

Learners sometimes used DIV instead of MOD which could result in incorrect output. The correct use of MOD and DIV is not well known by learners.

QUESTION 1.3
(c) Provide suggestions for improvement in relation to Teaching and Learning.

MOD and DIV has proved to be difficult concepts for most learners and extra teaching time on this topic is required.

QUESTION 1.4 Average mark: 59%

Topics Tested:

Input and Output components, String handling, Iteration, Decisions

(a)	**General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**

This question resulted in an average response from learners.

QUESTION 1.4

(b)	**Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.**

The learners did not read the question carefully and therefore they did not know that they must stop the display (therefore stopping the loop) when the step forward instruction reaches a count of 10. Marks were lost because of this.

Learners used the process of not stopping the loop but calculating a counter and then only displaying a message that the number of steps forwards exceeds 10 <u>after</u> all the steps have been displayed, which resulted in marks lost.

The use of BREAK and EXIT was either not applied by many learners or it was situated in the incorrect place in code.

Incrementing a counter for stepping forward as well as incrementing the same counter for turning left or turning right was the incorrect way to solve the problem and the question was therefore not read correctly.

QUESTION 1.4

(c)	**Provide suggestions for improvement in relation to Teaching and Learning.**

The use of BREAK or EXIT is not usually emphasized in teaching and learning but this question does give insight into what is expected when using these instructions. Using a *"boolean"* flag to stop a loop is the more commonly learnt method. It would be advisable to inform learners and practice the use of *BREAK* and *EXIT* in various examples.

QUESTION 1

(d)   Describe any other specific observations relating to responses of learners.

Q.1.1.

Properties that are changed before runtime in the Object Inspector resulted in no marks. Fortunately, there were no occurrences of this error.

Q.1.2.

Learners used the following solution:

   *volume := (pi * power(radius,2) * height) - (pi * power(radius,2) * 1)*

instead of using the solution below:

   height := height – 1;

   *volume := pi * sqr(radius) * height*

Calculating the volume using the first method is more complex than the second method but <u>both are correct.</u>

Q.1.3.

Instead of using MOD, learners used the following <u>correct</u> method to determine if the number B is a factor of number A:

   Factor := A/B

   if FRAC(Factor) = 0 then B is a factor of A

Learners used DIV in the correct way:

   If A DIV B = A/B then B is a factor of A

Learners also used VAL, although this is a complex way to solve the problem and not recommended:

   sResult := floattostr(A/B) ;

   VAL(sResult, inum, icode);

   IF icode = 0 then B is a factor of A

Q.1.4.

Using "<> 10" to test how many steps forward has occurred, does not result in the correct output. The statement can include a combination of <,>,= , depending on the logic of the rest of the code, but never both "<" and ">".

Learners could use a Repeat loop or a While loop or a For loop.

Learners could use BREAK or EXIT with all loops but only if these statements were placed in the correct position in code.

If learners used a *boolean* flag, it would have been easier to have successful output.

If learners can't do the processing of a question, then they must at least do the input and output.

QUESTION 1
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

Counting lines in a *"richedit"* instead of incrementing a counter, is <u>not</u> allowed.

Teachers need to be aware of this and prevent learners from using this method.

Teachers need to always remember that it is easier for learners to understand the simplest method of performing a task.
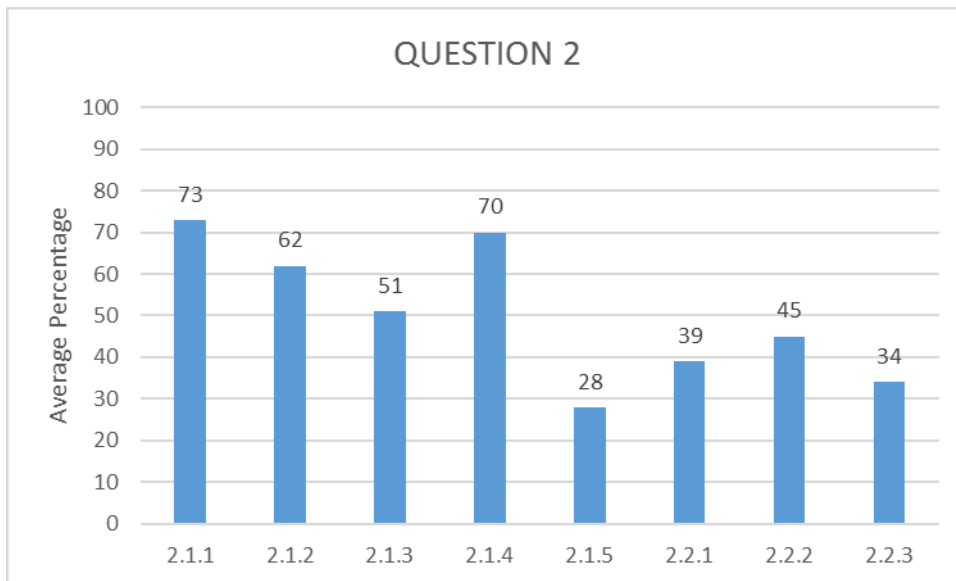
The functions MOD and DIV are confusing to learners and these need to be explained properly and simply in order for learners to be comfortable with the concepts and to be able to use these functions in many types of applications.

Working well with real and integer data types and using the correct methods to perform calculations with these numbers is a necessary skill learnt in Grade 10. Learners need to revise and memorize which built-in functions and procedures are used with each of these two numerical data types.

Teachers need to focus learners on the concept of a *"boolean"* flag, especially when solving problems like the one in Question 1.4.

building blocks for growth.

Page **8** of **8**
2018 Chief Marker's Report

PGDP
EASTERN CAPE
2004 - 2014

Ikamva eliqaqambileyo!

QUESTION 2   Average mark: 46%

This question was not answered as well as it could have been because it was an easy section of work.

Learners were confused between using SQL and ADOTable components.

Learners performed less when using the ADOTable components than when using SQL.

QUESTION 2.1.1 Average mark: 73%	
Topics Tested:	
Structured Query Language. Sorting and displaying.	
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?	
This question was done well by the learners.	
QUESTION 2.1.1	
(b) Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.	
Learners, incorrectly, used *"order by"* as one word, *"orderby".*	
Learners used *"Sort by"* instead of *"order by".*	
Learners made spelling mistakes, and therefore their code resulted in no output.	

building blocks for growth.

Ikamva eliqaqambileyo!

QUESTION 2.1.1
(c) **Provide suggestions for improvement in relation to Teaching and Learning.**
This was the simplest SQL statement and learners need to memorize the syntax and the rules involved in creating queries on a database.

QUESTION 2.1.2   Average mark: 62%
Topics Tested:
Structured Query Language. Displaying with criteria.
(a) **General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**
Learners performed relatively well in this question.
QUESTION 2.1.2
(b) **Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.**

- Learners spelt field names incorrectly.
- Learners did not read the question properly and left out the criteria of permanent employees
- Learners forgot to include the condition of "*permanent = true*" and/or they forgot to include the condition of "*children > 3*" in their answer statements.
- Learners included additional fields or did not include all the fields required in the "*select*" statement.
- Learners omitted the "*AND*" statement.

QUESTION 2.1.2
(c) **Provide suggestions for improvement in relation to Teaching and Learning.**
No additional fields for the select statement were allowed and learners need to read questions carefully.
Learners need to be reminded that correct spelling of table names and field names are crucial to a successful query on a database.

building blocks for growth.

Ikamva eliqaqambileyo!

QUESTION 2.1.3   Average mark: 51%
Topics Tested:
Structured Query Language. Displaying with criteria. Using Date Data type.
(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
This question was answered poorly.
QUESTION 2.1.3
(b)   Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
The majority of learners did not include a second table in the query. This is a two-table query.
Learners did not quote the join of the two tables in the query, even though they did include both tables in the *FROM* clause.
Learners did not use the '#' symbol to enclose the date sent to the database.
Learners did not include the correct fields in the select statement.
The statement below is correct. Any deviation from this format will not work.
Select p.PaymentNumber, e.IDnumber from tblPayments p, tblEmployees e where p.PaymentDate = #2017/01/17# ;
Using a wildcard with a date does not work, as in the example below.
PaymentDate LIKE "%2017/01/17%"
QUESTION 2.1.3
(c)   Provide suggestions for improvement in relation to Teaching and Learning.
Learners are introduced to two related tables in a relational database in grade 11. Emphasis should be made in grade 11 to explain this concept clearly and learners must do many exercises of splitting a table in Grade 11 so that it will be easier to write queries involving two related tables in Grade 12.

QUESTION 2.1.4   Average mark: 70%

Topics Tested:

Structured Query Language. Deleting with Criteria.

(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

This question was answered well.

QUESTION 2.1.4

(b)   Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

This was one of the easiest questions and learners who could not answer it have not been practicing database maintenance long enough in order to know how to delete, change or add records using SQL.

Learners placed statements in the incorrect order.

Learners placed the integer, 110, in single quotes and therefore they do not understand the use of datatypes in SQL statements.

QUESTION 2.1.4

(c)   Provide suggestions for improvement in relation to Teaching and Learning.

The three SQL statements to make physical changes to the database, namely "*Update*..*Set...",* "*Insert..Into...*" and "*Delete...",* need to be highlighted in teaching and learning.

QUESTION 2.1.5   Average mark: 28%

Topics Tested:

Structured Query Language. Displaying with Criteria. Using Dates, Formatting, Calculations, Aggregate functions and Grouping results.

(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

Very few learners achieved success in this question. The top learners struggled with this question as well.

building blocks for growth.

Ikamva eliqaqambileyo!

QUESTION 2.1.5
(b) Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
Many learners did not use "*SUM*" before subtracting the deductions from the gross salary. Learners did not use "*FORMAT*" to display the "*total amount paid*" field as currency. Many learners did not know how to use the *Month* function in SQL to extract the month from a "*date*" data-type. Learners did not use the "*AS*" statement to name either the total amount paid calculation or the month number for display purposes. Many learners left out the *"group by"* statement. Learners do not know how to manage aggregate functions. Learners used both "*Group By*" and "*Order by*". The combination of these two is incorrect in this question. Learners incorrectly used the word "*groupby*" instead of "*Group by*".

QUESTION 2.1.5
(c)   Provide suggestions for improvement in relation to Teaching and Learning.
This question involved aggregate functions and "*group by*" statements. This section of work includes the most difficult SQL statements for Grade 12 and therefore needs to be focused on during teaching and learning.

QUESTION 2.1
(d)   Describe any other specific observations relating to responses of learners.
Q.2.1.2. The following 3 statements can be used for the same condition of "*permanent = true*": *Permanent LIKE TRUE* *Permanent = -1* *Permanent = yes*

building blocks for growth.

Ikamva eliqaqambileyo!

Q.2.1.3.

Spacing in SQL statements is very important.

The following statements will not work:

"Delete from tblPayments where PaymentNumber=110"

(Spaces required before and after the equal sign).

"Select from tblEmployees"*

(Spaces required before and after the Asterix).

Using *"LIKE"* with dates is not recommended but if the learners did use it then the following format does <u>not</u> work: *PaymentDate like ' '2017/01/17' '*   (i.e. incorrect)

The following format <u>does</u> work: *PaymentDate like "2017/01/17"*   (i.e. correct)

Q.2.1.4.

The following starting statements are all correct and will work:

"Delete from….."   OR   *"Delete * from….."*   OR   *"Delete fieldname from……"*

QUESTION 2.1
(e)   Any other comments useful to teachers, subject advisors, teacher development etc.

Learners forget that SQL is sensitive to spacing and this needs to be emphasized in teaching and learning.

There are many activities available in the text book for practicing SQL as well as detailed lists containing all the functions in SQL required for Grade 12 in the Exam Guidelines and in the text book.

Learners need to study this information thoroughly and then apply the concepts in different exercises.

This question is a 'new' section that was re-introduced in the exam papers. It was communicated via the Exam Guidelines as well as the Exemplar paper, so learners should have expected this question.

This section of work is also expected to be used in the PAT.

building blocks for growth.

Page **14** of **14**
2018 Chief Marker's Report

PGDP
EASTERN CAPE
2004 · 2014

Ikamva eliqaqambileyo!

QUESTION 2.2.1   Average mark: 39%
Topics Tested:
Database Processing using linked tables. Creating summaries. Iteration. Decisions.
(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
This section of work was answered with less success than Question 2.1.
QUESTION 2.2.1
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Learners forgot to navigate to the next record inside the loop, or they placed the "*NEXT*" instruction in the wrong order either outside or inside the loop.

Learners did not include the table names when quoting the field names.

Example of incorrect code:

ssur := ['Surname'];

sname := ['FirstName'];

ichild := ['Children'];

if ['Permanent'] = 'false' then…

Learners did not include the condition of temporary employees in their answers.

Learners forgot to navigate to the first row of the table before the loop.

Learners did not know that they need a loop to navigate through the table.

Learners looped incorrectly from 0.

Many learners did not set the pointer in the table to the first record.

QUESTION 2.2.1
(c)   Provide suggestions for improvement in relation to Teaching and Learning.

Database programming is usually started late in the year in Grade 11 and Grade 12.

Starting with Databases in the <u>first term</u> for <u>both</u> grades should ensure that these

concepts and methods are given enough time for thorough understanding of the skills required for learners to begin the PAT task for Grades 11 and 12.

QUESTION 2.2.2   Average mark: 45%
Topics Tested:
Database Processing using linked tables. Adding records.
(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
The question was answered with average success.

QUESTION 2.2.2
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
Learners set the "*EmployeeNumber* " field to a value, but this is incorrect because "*EmployeeNumber*" is a field that is set to an "*autonumber*" data type in the table. Learners were confused between *SQL* and *ADOTable* processing in this question. The learners used "*insert into*" instead of the "*insert*" instruction. Learners matched the integer field in the table to a string data type. Navigation in order to POST the record was omitted.
QUESTION 2.2.2
(c)   Provide suggestions for improvement in relation to Teaching and Learning.
Teachers need to emphasize the basic principles of allocating values to the matching data types of fields in a table. Flexibility is included in database maintenance using *ADOTable* components in this regard, but it is preferable for learners to remember to match data types in statements as is taught in grades 10 and 11.

building blocks for growth.

Page **16** of **16**
2018 Chief Marker's Report

PGDP
EASTERN CAPE
2004 - 2014

Ikamva eliqaqambileyo!

QUESTION 2.2.3   Average mark from: 34%
Topics Tested:
Database Processing using linked tables. Updating records. Mathematical Calculations
(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
This question was answered poorly.
QUESTION 2.2.3
(b)   Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
Learners did not use the correct formula, i.e. they did not calculate 1 percent of the Gross salary field before adding that calculation to the deduction field. Learners used "*UPDATE*" instead of *"EDIT".* Learners did not use *"POST".* Learners entered a string for a *boolean* data type.
QUESTION 2.2.3
(c)   Provide suggestions for improvement in relation to Teaching and Learning.
Changing the value of a field in a database can be a confusing concept to learners and they find it difficult to distinguish between editing and inserting. It would be helpful to remind learners that editing involves changing only <u>one field</u> of one record and inserting involves allocating values to <u>many fields</u> of one record.
QUESTION 2.2
(d)   Describe any other specific observations relating to responses of learners.
Q.2.2.1. Learners were allowed to use a "*FOR*" loop instead of the "*WHILE"* loop in order to navigate through the table. Example: *for k := 1 to tblEmployees.recordcount do*

Learners were allowed to enclose the Boolean data type with single quotes.

Example: *If permanent = 'false'.*

Q.2.2.2.

Learners were allowed to use "*APPEND*" in the place of "*INSERT*". Although this is not recommended, it does work.

"*UPDATERECORD*" or any other navigation, e.g. "*NEXT*", can be used instead of "*POST*".

The above statements are not recommended in teaching and learning, even though they do work.

All fields entries can be enclosed with single quotes, including integers and real numbers. This does work, but it is not recommended for teaching and learning.

The identity number can also be typed without quotes, even though it is a string data type.

This question highlighted the flexibility of the "*AdoTable*" component with respect to data types.

Q.2.2.3.

Learners do not need to work with variables but rather work directly with the field values of the table.
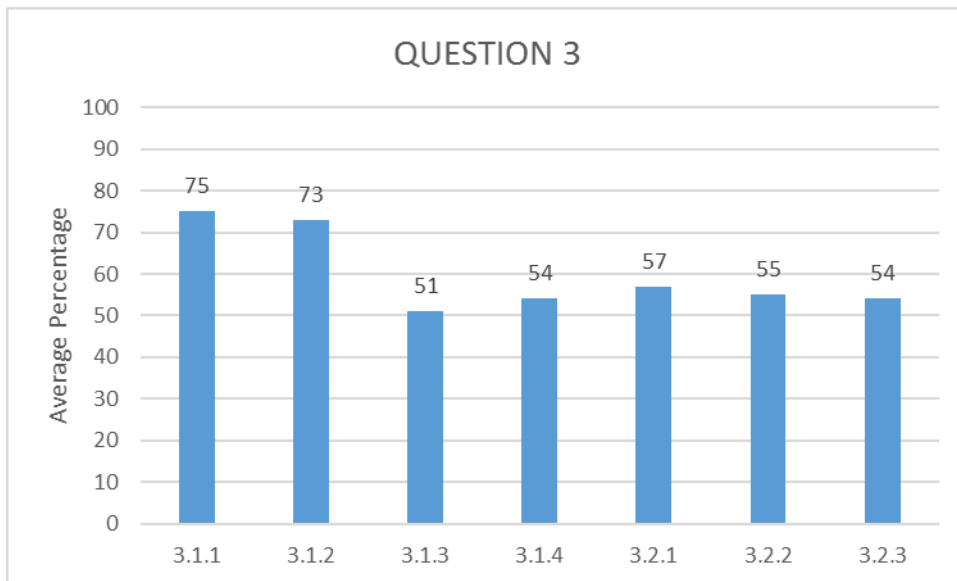
QUESTION 2.2
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

Database processing and maintenance is introduced in Grade 11 and the concepts in this question are taught in Grade 11. The practical projects (PAT) in Grade 11 and Grade 12 require this skill.

Many learners did not use the *richedit* for display when working with an *ADOTable* component. They referred incorrectly to the *DBGrid* when doing this question. This is not correct and teachers need to be aware of these mistakes.

QUESTION 3   Average mark: 58%

This question involves a difficult concept (Object-oriented Programming) but the learners managed to answer most of the questions.

This question tests OOP principles and solutions must involve using a class unit AND a main unit. There were learners who completed the class inside the main unit and therefore lost marks.

QUESTION 3.1.1 Average mark: 75%
Topics Tested:
Object Oriented Programming, User-defined methods with Parameters
(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
This question was answered well.

QUESTION 3.1.1
(b)   Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

building blocks for growth.

Ikamva eliqaqambileyo!

Learners did not know how to write a constructor method.

Learners were confused about the data types of parameters. They were given a table of the field data-types but they did not check this before writing the constructor.

Identity numbers, dates and phone numbers must always be string data types

Learners were not clear on their naming conventions and did not give 'easy to understand' names to variables.

Learners did not use the word *Create* as the name of the Constructor. This was not marked as not correct but it is not advisable and should not be taught.

Many learners made the mistake of assigning the year as an integer data type instead of a string.

Learners included fewer or more parameters.

Learners reversed the assignment statements which resulted in an incorrect solution.

QUESTION 3.1.1
(c) Provide suggestions for improvement in relation to Teaching and Learning.
User defined methods are taught in Grade 11. This question involves knowing how to create methods. A constructor works in the same way as a procedure and this needs to be explained to learners.

QUESTION 3.1.2 Average mark: 73%
Topics Tested:
Object Oriented Programming, User-defined methods
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
This question was answered well.
QUESTION 3.1.2
(b) Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
Learners did not include the data type of the return value of the function. Learners wrote a procedure instead of a function.

PGDP
EASTERN CAPE
2004 - 2014

Ikamva eliqaqambileyo!

QUESTION 3.1.2
(c) **Provide suggestions for improvement in relation to Teaching and Learning.**
Writing a function is taught in grade 11 and this needs to be revised.

QUESTION 3.1.3   Average mark: 51%
Topics Tested:
Object Oriented Programming, User-defined methods with Parameters
(a) **General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**
With this question the learners achieved an average result in performance.
QUESTION 3.1.3
(b) **Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.**
Learners wrote a function instead of a procedure. Learners did not include the parameter of the procedure. Learners did not add the parameter of the procedure to the private field first before allocating a new value to that private field. If learners included a local variable, they used that variable instead of the parameter of the procedure to increment the private field.
QUESTION 3.1.3
(c) **Provide suggestions for improvement in relation to Teaching and Learning.**
Creating methods needs to be revised in Grade 11. Learners need to be reminded that procedures perform operations/calculations and functions also perform operations/calculations BUT the difference between the two is that only functions (or procedures with variable parameters) will return the result of these operations/calculations to a calling statement. Another way to explain this concept is:

If the word "*return*" occurs in a problem description, then you must create a function, or a procedure with a VAR (variable) parameter.

If the word "*return*" does not occur in a problem description, then you must create a procedure.

If the word "*receive*" occurs in a problem description, then ONLY that/those word/s <u>must</u> be a parameter/s of a method.

QUESTION 3.1.4 Average mark: 54%

Topics Tested:

Object Oriented Programming, User-defined methods with Parameters

(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

The performance by learners in this question was average.

QUESTION 3.1.4

(b)   Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Learners did not know how to use "*POS*", "*COPY*" or "*DELETE*" in order to successfully answer this question.

Learners copied the last 2 characters from the owner name, which is the parameter of the function, instead of from the restaurant name, which is the private field of the class.

Learners used ",2" instead of ",1" when using copy to obtain the last two characters of the restaurant name. i.e. Learners did not know how to copy the last two characters from a string.

Learners created a procedure instead of a function and did not include a variable (return) parameter in the procedure.

Learners did not include a parameter in the function.

Learners declared unnecessary variables.

Learners included the wrong data type as a parameter of the function.

QUESTION 3.1.4

(c)   Provide suggestions for improvement in relation to Teaching and Learning.

Learners did not understand that the word 'compile' describes the joining of parts into one long string. This concept needs to be addressed in teaching and learning.

QUESTION 3.1

(d)   Describe any other specific observations relating to responses of learners.

3.1.1.

The Constructor can be given any name.

Example:

constructor TRestaurant.Update(name, year, numemploy: string);

begin

fname := name ;

fYearOpened := year ;

fNumEmployees   := STRTOINT(snumemploy) ;

end;

3.1.4.

Alternative code that works to obtain the last 2 characters of a string:

Delete(OwnerName,1, length(Ownername)-2) ;

Or:

llet := copy(lletters, len - 2 , len);

There were learners who wrote the class definition methods in the main unit.

This resulted in marks being lost because the class definition is defined in a separate unit which had to be completed first. It was therefore difficult for these learners to write the correct code <u>for</u> the methods as well as write the correct code to <u>use</u> the methods in order for the output to be correct.

Learners need to be taught how to use "Ctrl+Shift+C" so that they can automatically implement the method headings that they create in the interface section.

building blocks for growth.

Page **23** of **23**
2018 Chief Marker's Report

PGDP
EASTERN CAPE
2004 - 2014

Ikamva eliqaqambileyo!

QUESTION 3.1

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

It is possible to write a class definition inside an existing unit in which it will be used, but teachers must recognize that this is a complex and complicated solution. Hard coding must not be done because all code must work for all test data and not only for the sample solutions given.

QUESTION 3.2.1 Average mark: 57%

Topics Tested:

Object Oriented Programming, Using User-defined methods. Input and Output components.

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

The results of learners' performance in this question were relatively good.

QUESTION 3.2.1

(b) Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Learners did not know how to use a constructor and left that instruction out of their solution.

Learners called the constructor incorrectly.

Example: *objRestaurant.Create(sName, iYear, iNumEmployees) ;*

 Or :   *TRestaurant.create(sname, syear, iemployee);*

Both are incorrect statements for using the constructor.

The following mistakes were also made by learners:

- Declaring variable data types in the parameter list when calling a procedure or function.

- Learners used local variables in calculations, etc. before initializing them to a value.

- Learners freed the object after their solution and therefore they were not able to use the object in the subsequent questions.

QUESTION 3.2.1

(c)   Provide suggestions for improvement in relation to Teaching and Learning.

Information such as the data types of variables are given at the start of examination questions and learners are expected to have read this information and use the given data types.

QUESTION 3.2.2 Average mark: 55%

Topics Tested:

Object Oriented Programming, Using User-defined methods. Input components.

(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

This question had an average percentage of successful answers by learners.

QUESTION 3.2.2

(b)   Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Learners used the class name instead of the object name when calling the *"compilecode"* function. Example: *code:=TRestaurant.compilecode('John Doe');*
Learners did not know how to use a function.

Learners did not write the function correctly or did not write the function at all in the previous question and therefore had a problem with answering this question.

Learners called the function as though it was a procedure including more than one parameter, even though they wrote the method as a function with only one parameter.

QUESTION 3.2.2

    (c)   Provide suggestions for improvement in relation to Teaching and Learning.

Using user defined methods (re-use of code) is taught in Grade 11 and the same concept is applied here. A good grounding in this aspect of programming will be helpful for learners to be successful in Object Oriented Programming.

QUESTION 3.2.3 Average mark: 54%

Topics Tested:

Object Oriented Programming. Using User-defined methods. Input and Output components. Decisions. Mathematical Calculations.

    (a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

This question had an average percentage of successful answers by learners.

QUESTION 3.2.3

    (b)   Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Learners made mistakes in the following instances:

- Learners increased the number of employees before checking to see if that number can be increased and not be greater than 40.

- Learners wrote the method originally as a procedure in the class definition but used it as a function in the main unit

- Learners used the class name instead of the object name when calling the "*getnumemployees*" function.

- Learners did not call the "*getnumemployees*" function to find out if there will be space for more employees at the restaurant before adding more employees to the restaurant.

- When testing if the new proposed total of employees is less than or equal to the maximum allowed of 40, learners used "*itest < 40*" instead of "*itest <= 40*".

QUESTION 3.2.3

(c) **Provide suggestions for improvement in relation to Teaching and Learning.**

It is important to emphasize the fact that functions are called/used differently to the way procedures are called/used and learners must remember, or look back at, the various functions and procedures that are written in the class definition.

QUESTION 3.2

(d) **Describe any other specific observations relating to responses of learners.**

Q.3.2.1.

Learners were allowed to use a *showmessage* component to display the message. Learners were allowed to use the number 40 instead of using the constant provided.
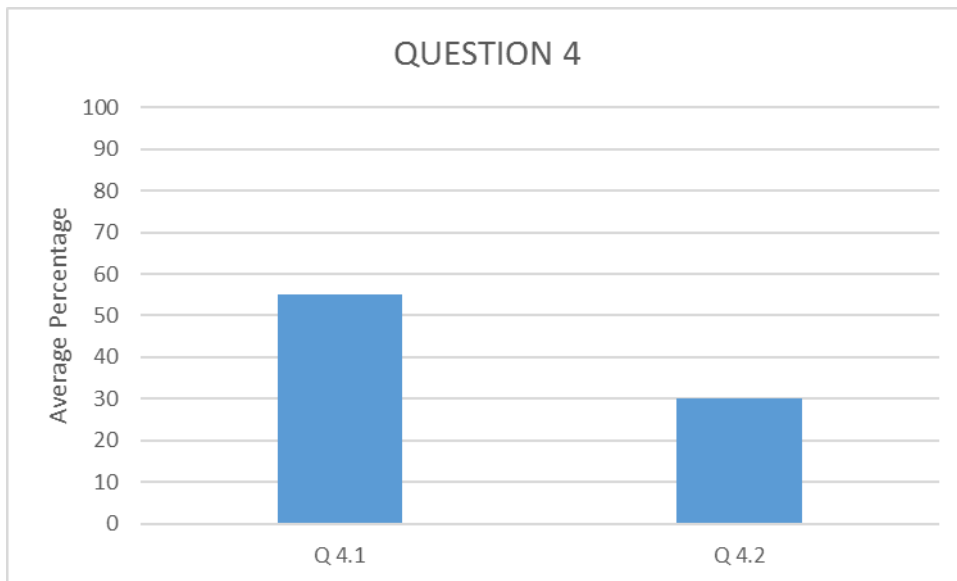
QUESTION 3.2

(e) **Any other comments useful to teachers, subject advisors, teacher development etc.**

Re-use of code is a programming tool which is vital for the development of efficient and successful applications. Creating a class is easier than using a class. If the class is successfully created and compiled, then it is easier for learners to understand the mechanism involved in using a class.

When submitting the learners' answers as printed output, teachers must print the class unit first and then the main unit which represents the answers as in the same order of the question paper. Please note that printing code for marking is optional.

QUESTION 4   Average mark: 41%

Question 4.1 was answered well, but Question 4.2 proved to be a challenge for learners.

QUESTION 4.1 Average mark: 55%

Topics Tested:

Reading from a Text file. String Handling. Input and Output components. Iteration. Decisions.

(a)	**General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**

This question resulted in an average performance by learners.

QUESTION 4.1

(b)	**Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.**

Learners' mistakes included the following:

- Forgetting to initialize a counter for the number of array entries.
- Using "*pos*" and "*copy*" incorrectly.
- Not incrementing the counter.
- Incrementing the counter before finding a match between the months.

building blocks for growth.

Ikamva eliqaqambileyo!

- Incorrect order and use of "*assignfile*", "*reset*" and the loop to navigate the text file.

- Not obtaining the position of the "#" correctly.

- Confusing the position of the dash with the position of the hash.

- Forgetting to include "*assignfile*" and /or "*reset*" statements.

- Forgetting to show a message at the end.

QUESTION 4.1

(c)   Provide suggestions for improvement in relation to Teaching and Learning.

Teachers need to make sure that learners know how to read lines from a text file, create a text file and add lines to a text file using the correct order of operation of the coding required.

The concept of compiling data from text files into arrays and then the results being displayed into output components like *richedits*, needs to be well understood and practiced.

Learners need to be aware that this process involves copying data from permanent storage into memory (temporary storage) in order to speed up processing.

QUESTION 4.1

(d)   Any other comments useful to teachers, subject advisors, teacher development etc.

Many learners looped from 1 to 365 when reading from the text file. This is a correct option to use ONLY because the question paper stated that there were 365 lines in the text file.

QUESTION 4.2 Average mark: 30%

Topics Tested:

String Handling. Input and Output components. Iteration. Decisions. Two-dimensional arrays and One-dimensional arrays. Pattern recognition. Mathematical calculations.

(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

This was a very difficult question and many learners did not attempt to answer it.

A high level of confidence in coding is required for this question.

This is a high order question that learners cannot prepare for.

QUESTION 4.2

(b)   Why was the question poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Learners did not know how to access groups of items from a one-dimensional array.

Learners who attempted to solve the problem using a 2D-array variable did not obtain maximum marks. The 2D-array solution is a much more complex and complicated method to solve this question.

Many learners did not allow for the empty days before the start day of the week in the display.

Learners looped from "*1 to 31*" or "*1 to length(arrcustomers)*" instead of using the number of days for the month selected, which should have been a global variable from Q.4.1.

February has 28 days, etc., therefore numbers from a previous month were appended onto the last week for a month having fewer days. This would have also been a problem if the array counter from Question 4.1 was not declared as a global variable.

Many learners did not enclose the array contents in brackets for the display in the "*richedit.*"

Leaners did not initialize an empty string for each week.

Learners did not allow for the last week of the month.

Learners did not calculate how many weeks would be involved in the display.

QUESTION 4.2

(c)   Provide suggestions for improvement in relation to Teaching and Learning.

Traversing through an array is a concept that is not given enough time in the classroom. Searching, sorting, inserting, removing one item and removing duplicate items in an array or parallel arrays are all concepts that need to be

building blocks for growth.

Ikamva eliqaqambileyo!

covered for examinations. Teachers need to be creative and find activities that solve real world problems with array manipulation in class.

Teachers can use past papers to practice the open-ended type of question where the learners can use any method to solve the problem.

QUESTION 4

(d)   Describe any other specific observations relating to responses of learners.

Q.4.1.

The following statements below are allowed when copying the month from a line from the text file:

Smonth := copy(sline,pos('#',sline))

Smonth := copy(sline, pos('#',sline), length(sline))

Learners had to know that they must create a global counter variable to count the number of lines that include the chosen month.

This counter is then used to fill the global array and it is required in Q.4.2.

The counter (initialising, incrementing) can be replaced by using character manipulation to extract the index from the line of text, in other words, learners could copy the day number from the "*textfile*" line and use that day number, converted to integer, as the counter for the array.

Q.4.2.

Successful learners produced many alternative successful solutions and these were successfully matched with the marking grid.

Writing the code for this question using a 2-dimensional array is very difficult. No learner who attempted to use this method were able to achieve 100 percent for this question. Only a few learners tried this method.

The two-Dimensional array solution algorithm is below:
Declare a 2-dimensional array, 6 rows and 7 columns
Set all 2darray cells to empty strings
*Get starting day of the week (**weekday**) from combobox (itemindex + 1)*
Set counter for number of days (daynum) in the month to 0
Set row counter to 0
While row <= 6 (start of while loop for row counter)
*   Inc(row)*

Set column counter (col) to 0 (col is used to control the loop - to make sure of 7 iterations)

*While (col < 7) and (**weekday** <= 7) and (counter for days in the month(daynum) <= 31)*

Inc(daynum)

Inc(col)

If daynum <= global array counter

Set string (sline) to day number str(daynum) and array content using daynum index

*Add sline to 2darray in row index (row) and column index (**weekday**)*

*Add 1 to **weekday***

(End of while loop for column counter)

*Set **weekday** to 1 (to start a new week)*

(End of while loop for row counter)

Call procedure display (display using normal algorithm to display a 2d array in a richedit)

QUESTION 4

(e)   Any other comments useful to teachers, subject advisors, teacher development etc.

This question involved converting a single dimensional array into a virtual two-dimensional array, according to a certain given configuration/pattern.

This question was a good challenge and highlighted a different aspect of array manipulation. Teachers should focus on this type of problem solving in the classroom in order to ensure future success for their learners.