KZN DEPARTMENT OF EDUCATION

GREENBURY SECONDARY SCHOOL

JUNE EXAMINATION 2017

# INFORMATION TECHNOLOGY

## GRADE 10 - PAPER 1

### Date: 06 – 06 – 2017

**DURATION: 3  HOURS**                        **MARKS: 150**

**EXAMINER: M PADAYACHEE**                 **MODERATOR: S NAIDOO**

## INSTRUCTIONS:

1.  Answer **ALL** Questions.

2.  This paper consists of **3** questions and **5** pages including the cover page.

3.  Ensure that you have 3 folders for all three questions.

4.  Change the name of the folder given to you to <u>your name followed by your grade and division</u>. E.g. Ryan10F.

5.  Read **ALL** the questions carefully. Do not do more than is required by the question.

6.  Open all your programs and ensure that they execute without errors.

7.  After every 5 to 10 minutes click save all as this will secure your work in the event of any power disruptions.

7. Time management is your responsibility. Ensure that you do not spend too much of time running your program.

> SCENARIO
>
> *As IT learners, you will learn that the school will place high expectations on you. You will be approached by various departments of the school to develop software to solve specific problems that they experience.*

## QUESTION ONE

The Governing body of the school has decided to do some renovations to the current building structures. They have decided to re-tile and repaint certain structures. Your assistance is required to complete the code to do the necessary calculations for the given structure and display the costs as shown in the sample outputs.

The following details have been provided:

> ➢ The height of all walls is 3 metres.
> ➢ The cost of paint is R43 per litre. Each litre can paint an area of 6 square metres. Each wall requires two coats of paint.
> ➢ All doors and windows on the premises have the same dimensions:
>   > a) Doors are 1 metre wide and 2 metres high.
>   > b) Windows are 60 centimetres wide and 60 centimetres high.

Examine the tables below and answer the questions that follow:

The School has three basic building types:

| TYPE OF BUILDING STRUCTURE |
| --- |
| Rectangular Office |
| Square classroom |
| Round Conference room |

The school is only allowed to purchase from the list of tiles below:

| LIST OF TILES ON SPECIAL |
| --- |
| 0.5m BY 0.5m AT R72 per box of 8. |
| 30cm by 30cm at R69 per box of 10 |
| 0.45m by 0.25 at R81 per box of 12 |

1.1. Open the Delphi project file called **Q1Proj** and fill in the values for the combo box with the heading according to the table using the object inspector. (4)
1.2. Set the title for the list box, using the label, as shown on the table using code in the on show event of the form. (2)
1.3. Complete the values for the list box according to the appropriate table given using the object inspector. (3)
1.4. Set the spinner max/min for the number of doors to (0..2) in the object inspector. (2)
1.5. Set the spinner max/min of the number of doors to (2...15) in the objector inspector. (2)
1.6. Set the spinner max/min of the number of the selected building structure to 1...50 in the object inspector. (2)

Sample Output:



1.7. Complete the code for the **PAINT** button that does the following:

1.7.1. Allows the user to enter the dimensions according to the selection of the shape from the combo box.

Index 0 requires a length and a breadth/width.

Index 1 requires a length only.

Index 2 requires a radius.

You must ensure that all values of the components are correctly entered. Thereafter Calculate the cost of re-painting the building structure selected.     (15)

1.8. Complete the code for the **TILE** button to calculate the cost of tiling according to the list selection. You must display the number of tiles needed and the number of boxes required as well as the cost of tiles.     (10)

1.9. Program the **TOTAL COST** button to determine and display the total cost of all renovations for that particular building type by using the number of the building structure. Labour charge is R180 per labourer per day, therefore you need to ask the user to enter the number of days as well as the number of labourers.     (10)

_____[50]_____

## QUESTION TWO

Your IT educator wants to complete a Delphi code to assist in doing conversion of numbers from base 10 to a specified base. Study the flowchart provided to you and use it to develop a code that will be able to convert any number to a specified base. Open the file called **Q2Proj**.
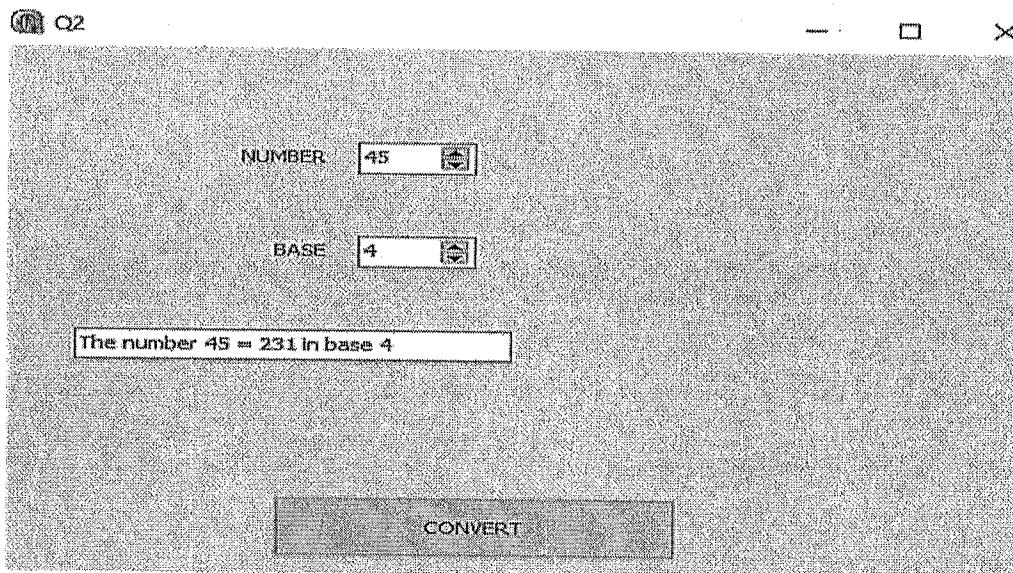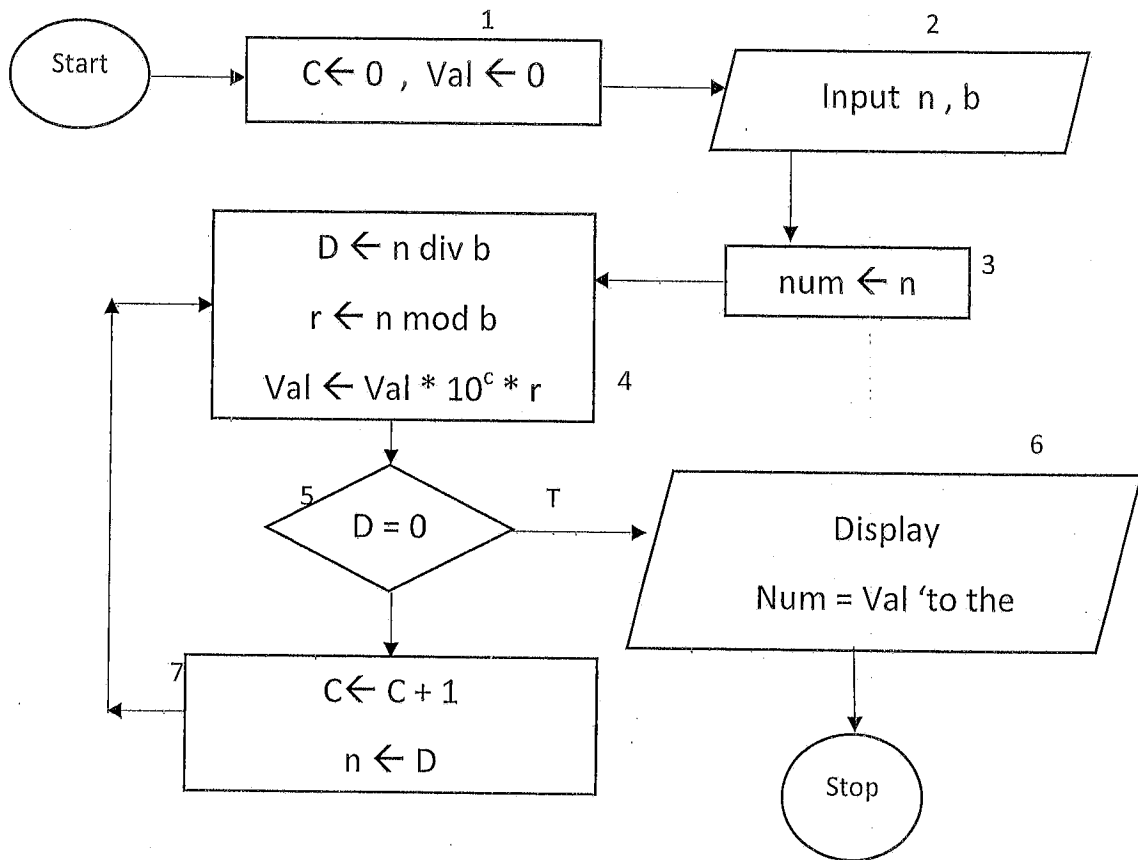


Program the button **CONVERT** to accept the input from the two Spinners: Number and Required Base respectively. The result must be displayed the as shown in the sample output.     (25)

[30]

## QUESTION THREE

The grade 8 educators are looking for a software to assist them to teach the grade 8 learners the concept of factors and division. Learners have to physically see the numbers and outputs in order to interact with the process of actually finding factors. You are required to assist in teaching the learners about the following terms.

➢ GCD(Greatest common divisor) this is the largest number that is divisible by any two numbers given. Also known as the HCF.

➢ LCM(Lowest common multiple) the smallest value that is a multiple of two or more numbers.

➢ A Prime number(A number with only 2 factors including 1 and the number)

➢ A Perfect number(A number whose factors add up to the number if itself is exclude as a factor)

Open the file called **Q3Proj** and do the following:

3.1. Code the button called **GCD** by prompting the user for two integer inputs and thereafter displaying the details as shown in the output.                    (13)

3.2. Code the **LCM** button to allow a user to enter two integer inputs and display the LCM between the two inputs.                    (13)

3.3. Code the **PRIME** button that allows the user to input a number and then display the message "PRIME' or 'NOT Prime' according to the number input.                    (13)

3.4. Code the button called **PERFECT** to accept an input from the user and then determine if the input is Perfect or not and display an appropriate message.                    (13)

3.5. Code the button **Generate** to generate 10 integers in the range 20 to 100 and display all the factors of each input.                    (18)

QUESTION 3                                                        —  □  ✕

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GCD          The GCD of 24 and 16 is 8
             The LCM of 9 and 4 is 36
             The number 51 is not prime
             The number 28 is perfect
LCM
             Your generated factors are:

             11 = 1,11
             12 = 1,2,3,4,6,12
PRIME        18 = 1,2,3,6,9,18
             78 = 1,2,3,6,13,26,39,78
             23 = 1,23
             51 = 1,3,17,51
PERFECT      45 = 1,3,5,9,45
             22 = 1,2,11,22
             31 = 1,31
             15 = 1,3,5,15

Generate
```