

**Higher National Unit Specification: General Information**

**Statement and Confirmation of Own Work**

**Unit Title: Mathematics for Computing**

**Unit code: D76E34**

**Superclass: CB**

**Publication Date: September 2018**

**Source: Scottish Qualifications Authority**

**Version: 01**

**Student declaration**

I have read and understood SQA HND’s Policy on Academic Dishonesty and Plagiarism.

I can confirm the following details:

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**Submitted Date : 28 September 2018**

**Table of Contents**

[**Introduction** 3](#_Toc517264113)

[**Activity 1** 3](#_Toc517264114)

[**Activity 2** 3](#_Toc517264115)

[**Activity 3** 4](#_Toc517264116)

[**Activity 4** 4](#_Toc517264117)

[**Activity 5** 5](#_Toc517264118)

[**Activity 6** 6](#_Toc517264119)

[**Activity 7** 6](#_Toc517264121)

Introduction

I ‘ve been requested to help in the design of a developed PC LCD Projector System as a member of a group.The Major Condition is that the room lights are mechanically faint when the projector is start working from the connected PC.The former idea is to have three light sensors placed side by side on the wall surrounded by the image area.The sensors are to be signal to one colour only,red green and blue respectively.They will start and produce an amount produced signal once a beginning level for their exact colour has been arrived.The arrangement of signals to pale the lights has been temporarily chosen to be any of the resulting combination:

1.When only the red and blue sensors are activated

2.If the green sensor and blue sensor are activated,neglecting the state of the red sensor

3. The red sensor is activated if both of the blue and green are not activated



**Activity 1**

## Identify and Label the inputs and outputs and their states

At first,we need to regard symbols for inputs.

"X" for red colour,"Y" for green and "Z" for blue.

And we also need output to regard.

Let output be "I".

**Activity 2**

**Produce a truth table**

|  |  |  |  |
| --- | --- | --- | --- |
| X | Y | Z | I |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 |

**Activity 3**

**Express the truth table as a Boolean expression**

I=YZ+X+XZ+XYZ

**Activity 4**

## Simplify the expression

I=YZ+XZ+X+XYZ

=YZ+XYZ+X+XZ

=YZ(+X)+X (Z+)

=YZ+X

=X+YZ

**Activity 5**

## Modify the Boolean expression to include this signal

I=(X+YZ)

# Activity 6

## Draw the equivalent circuit using standard AND,OR, and NOT gates



The logic gates are helped to calculate the inputs of the light sensor.At first, We need multiple the inputs X and Y.But, Input Y is NOT gate ,so it becomes .And then, we start to multiple on each other.As a result, we get X.And we again multiple input Z and . Then , we combine with Xand Z to form

(X+ Z).At that time, we multiple with (X+ Z).Thus, the answer of the output “I” is “I=(ZY+X)”.

**Activity 7**

## Diameter of the sensor face

1mm=0.001m

1m=1000mm

25mm=0.00025m

=2.5\*

4.195mm=0.004195m

=4.195

3.55mm=0.00355m

=3.55

Absolute error=Actual value-Measure value

Relative error=Absolute error/Known Value\*100%

=\*100%

=\*\*\*100%

=\*10

=0.5959\*10

= 5.959% (or) 6%

Absolute error=Actual value-Measure value

Relative error=Absolute error/Known Value\*100%

=\*100%

=\*\*\*100%

=\*10

=0.7042\*10

= 7.042%(or)7%

# X=M\*

= 300 000 000

300000000=3\*

# Report

At first , we need to change the dimensions from milimetres to standard scientific notation meters. When we want to find the result of the absolute error, we need to subtract from the actual value to measure value. If we want to know the relative error of the dimensions of the face of the sensor, we need to divided absolute error by known value and multiply with one hundred percent to know the percentage of the result. And we calculate again like the first problem to find another relative error.

# Symbol Expression

## When, X=Number

## M=Mentissa

## B=Base

## E=Exponent