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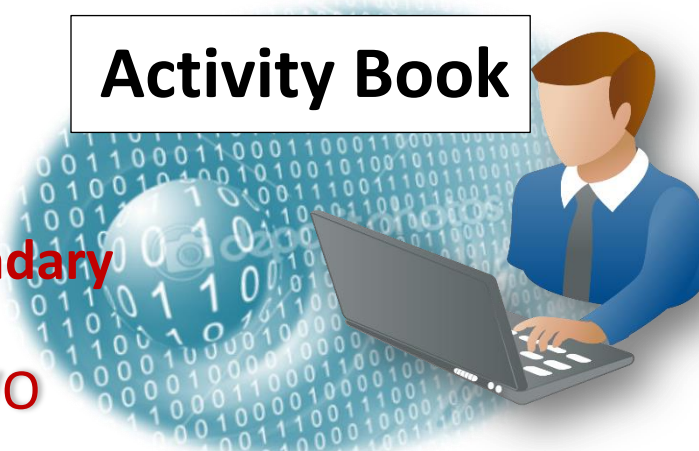
Information and Communication Technology

The Programming Projects

Activity Book

Third Secondary

UNIT TWO

Information and communication Technology

The Programming Projects

Third Secondary

Second Term

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Introduction

This book presents a comprehensive vision of the relationship between science, technology and society, which reflects the role of information and communication technology and its innovations in various fields of life and community development, through training students on the skill of the implementation of some software projects based on the Markup language HTML, programming languages PHP &VB.NET and applications such as Expression Web.

Those projects help students practice many of the technological skills and conscious behaviors by using information and communication technology, in addition to the development of their multi positive attitudes.

The first unit of the book deals with implementation of a project to convert a number between the numerical systems programmatically, and this unit includes a simplified explanation of numerical systems as a cognitive basic background, followed by display the unit topics that represent the stages of implementation of the project, and the implied skills that the students have to train on.

The second unit deals with the Logic Gates which is considered the basics for the electronic integrated circuits and it represents the basics for the computer and electronic devices, and how it performs through applied projects production which stimulate it, with showing some life applications to employ the idea of Logic Gates, by considering life decisions as a set of issues or mathematical formulas which can be evaluated and judged right or wrong , which is considered a lifestyle and style of thinking which helps in taking life decisions in a scientific method, which represents a very important input to qualify you, dear student, for your future life, and qualification towards the specialized study in this field.

GOD GRANTS SUCCESS

STAFF

Table of contents

Unit Two

Producing a project of logic gates simulation

At the end of this unit, learner should have the ability to:

1- Recognize scientific concepts and terminology that are connected to the computer (programming language, logic gates AND – OR – NOT).

2- Suggest simple projects in order to simulate logic gates (AND – OR – NOT).

3- Employ information & communication technology applications in creating his learning content and developing his duties.

4- Practice VB.NET& PHP skills in implementing his duties.

5- Follow the ethics and behavior of respect for copy rights when dealing with information, devices, networks and web applications services.

6- Employ interactive learning environments in his learning.

7- Employ logic gates in solving his educational and life problems.

8- Use information /electronic data in the performance of his research and educational functions in partnership with his classmates.

9- Employ technological tools and resources in supporting life taking – decisions.

First subject
Logic AND gate

Practice (1)

The circuit that is equivalent to the logic AND gate
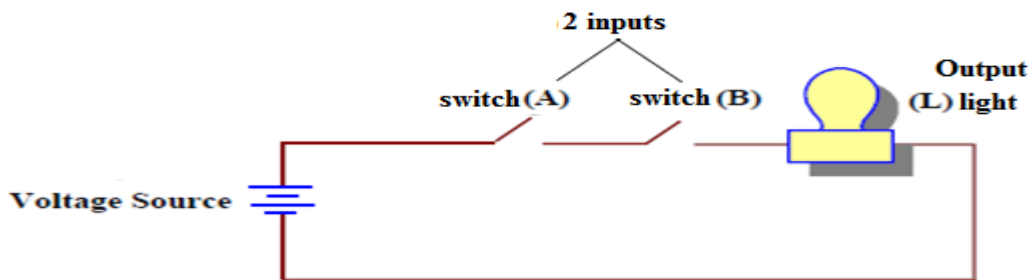
The required: Complete the following table which show the possibilities of the effect of the two switches (A, B) state on Light state (L) whether it is lighted or non-lighted.

A	B	L
Off	Off	....
Off	On	....
On	Off	....
On	On	....

Note: Switch is connected, means (On), switch isn't connected, means (Off).

Practice (2)

Forms (possibilities) of the output of the logic AND gate and the truth table.

Required: **Complete the following:**

Each logic gate has some forms or possibilities of its output, count the number of the forms (possibilities) of a logic gate that has 4 inputs, mentioning the used law.

a) Law of calculating the number of forms is:

$$N= . . . . . .$$

b) Number of forms of the logic gate that has four inputs equal ....

c) Complete the following truth table of AND gate that has three inputs which shows all possibilities of gates inputs and outputs.

C	B	A	L
0	....	0	....
0	....	1	....
0	....	0	....
0	....	1	....
1	....	0	....
1	....	1	....
1	....	0	....
1	....	1	....

Second subject
Producing a project of the logic AND gate simulation

Practice (1)

Designing the user interface of the project

Study the following figure of a proposal of designing a project window, with your classmates in the group, under the supervision of your teacher.
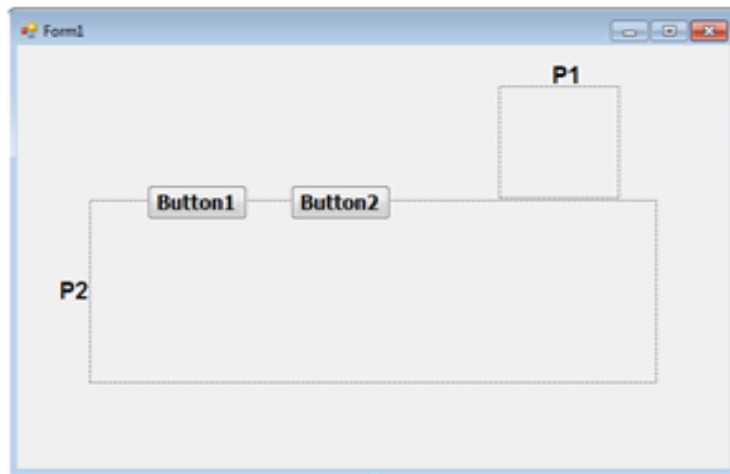
The required: <u>**Determine the proposal design elements, and its components:**</u>

Conclude Controls on the form window and the purpose of each of them, record your findings in the following table:

Control	Its purpose
Form1	-------------------------
Button1	An object that is used in------
Button2	An object that is used in implementing another code when we Click on it.
-----------------------	An object that is used in displaying Light image.
-----------------------	An object that is used in displaying the electric circuit image.

Activity (1)

Designing the user's interface implementation by using (Visual Studio. Net) application.

You can design the user's interface as in the shown figure.

And this is through the following procedures:

1- Open Visual Studio.Net application.

2-Insert controls as in the previous figure (exercise 1).

3-Adjust controls properties by using the following table:

Controls	Properties	Value
Form 1	Text	AND Gate
	BackColor	White
Button1	Text	Off
Button2	Text	Off
PictureBox1	SizeMode	Stretchimage
PictureBox2	SizeMode	Stretchimage
	Image	Andcircuit
	Activate PictureBox2 From the shortcut menu, choose "Send to Back"	

-

- Record your notes and questions

....

....

....

....

- Discuss it with your classmates and your teacher

....

....

....

....

Activity (2)

4) Use the following code to implement the project of "running the logic AND gate simulation".

```
Private Sub Form1_Load(ByVal sender As Object, ByVal e As
System.EventArgs) Handles Me.Load
    Me.PictureBox1.Image = Image.FromFile("off.jpg")
    Me.PictureBox2.Image = Image.FromFile("andcircuit.jpg")
    Me.Button1.Text = "Off"
    Me.Button2.Text = "Off"
End Sub
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e
As System.EventArgs) Handles Button1.Click
    If Me.Button1.Text = "Off" Then
        Me.Button1.Text = "On"
        If Me.Button2.Text = "On" Then
            Me.PictureBox1.Image = Image.FromFile("on.jpg")
        End If
    Else
        Me.Button1.Text = "Off"
        Me.PictureBox1.Image = Image.FromFile("off.jpg")
    End If
End Sub
Private Sub Button2_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button2.Click
    If Me.Button2.Text = "Off" Then
        Me.Button2.Text = "On"
        If Me.Button1.Text = "On" Then
```

Non-lighted light image

The circuit image

The lighted light image

```vb
            Me.PictureBox1.Image = Image.FromFile("on.jpg")
        End If
    Else
        Me.Button2.Text = "Off"
        Me.PictureBox1.Image = Image.FromFile("off.jpg")
    End If
End Sub
```

The third Subject
Producing a project of the logic AND gate in PHP language

Activity (1)

Producing a project of logic AND gate simulation In PHP language on the web page.

Activity Description:

Through the Expression Web application, you can start to insert the necessary controls of producing a project of "operating the logic AND gate simulation "on the web page, and you can write PHP code inside HTML code of the web page design.

Use the following PHP code in the project implementation.

```html
<html>
    <head>
            <meta                content="text/html;                charset=utf-8"
            http-equiv="Content-Type" />
                <title> AND GATE </title>
    </head>
<body>
    <form method="post" action=" ">
<?php
    $open="off.jpg";
    $choosekey1="off";
    $choosekey2="off";
    if(isset($_POST['Submit1']))
     {
    $choosekey1=$_POST['Select1'];
    $choosekey2=$_POST['Select2'];
    if ($choosekey1=="on" && $choosekey2=="on" )
     { $lightstate="on.jpg"; }
    else
     { $lightstate="off.jpg"; }
     }
?>

    <select name="Select1" style="width: 89px">
    <option> on </option>
    <option> off </option>
    <option        selected=        'selected'>        <?php        echo
    $choosekey1; ?> </option>   </select>
    <select name="Select2" style="width: 94px" >
    <option> on </option>
    <option> off </option>
    <option        selected=        'selected'><?php        echo
$choosekey2; ?> </option>   </select>
    <input                name="Submit1"                type="submit"
    value="Apply" />
    <input        name="Image1"        type="image"        height=
"123" src='<?php echo $lightstate; ?>' width="105" />
    <br />
    <img        alt=""        height="164"        src="andconect1.jpg"
    width="604" />
</form>
</body>      </html>
```

Fourth Subject
The Logic OR gate

Activity (1)

Truth table of the logic OR gate

Complete the following truth table of OR gate that has three inputs, which shows all possibilities of inputs and output of the gate.

C	B	A	L
0	………..	0	………..
0	………..	1	………..
0	………..	0	………..
0	………..	1	………..
1	………..	0	………..
1	………..	1	………..
1	………..	0	………..
1	………..	1	………..

Fifth Subject

Producing a project of the logic OR gate simulation

Activity (1)

Designing the user interface of the project:

The following figure is a proposal of the form window, and its necessary controls for the project production.
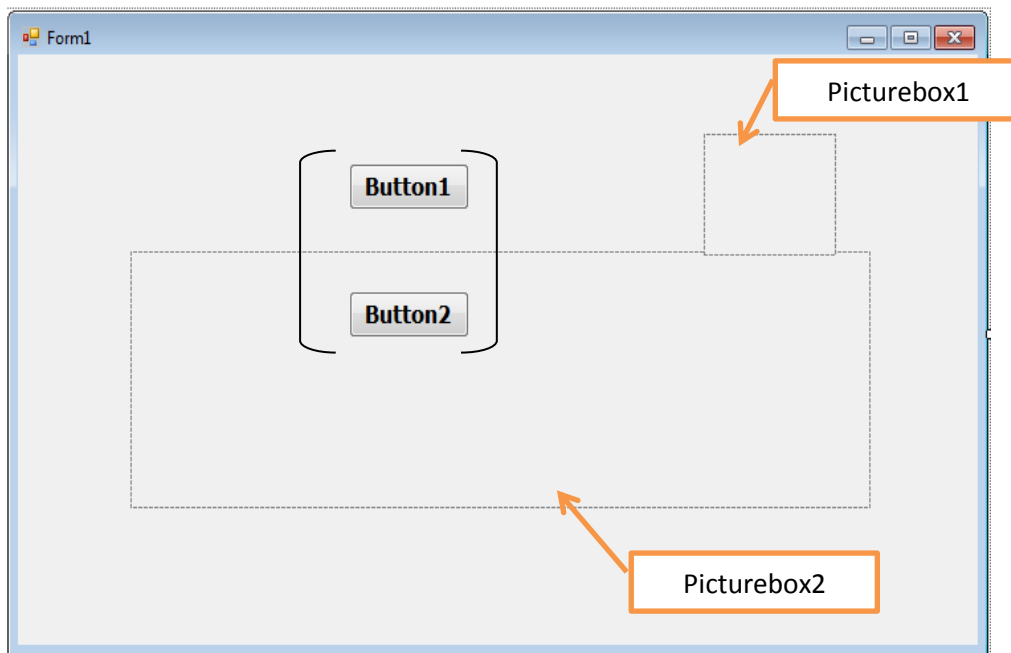
Co-operate with your colleagues in studying the figure, and determine the necessary elements for the project production, then conclude controls on the window and its purpose, record them in the following table:

controls	Its purpose
Form1	————————————
————————————————	An object that is used in implementing a specific code when clicking (click) on it.
Button2	—————————————————
———————————————	An object that is used in displaying Light image.
———————————————	An object that is used in displaying electric circuit image.

Activity (2)

Implementing a design of the user interface application (Visual Studio.Net)

Required: Implementation of the user's form window design by using Visual Studio.Net application.

Implement the following stages:

1) **Open VisualStudio.Net application.**

2) **Insert controls as shown in the figure.**
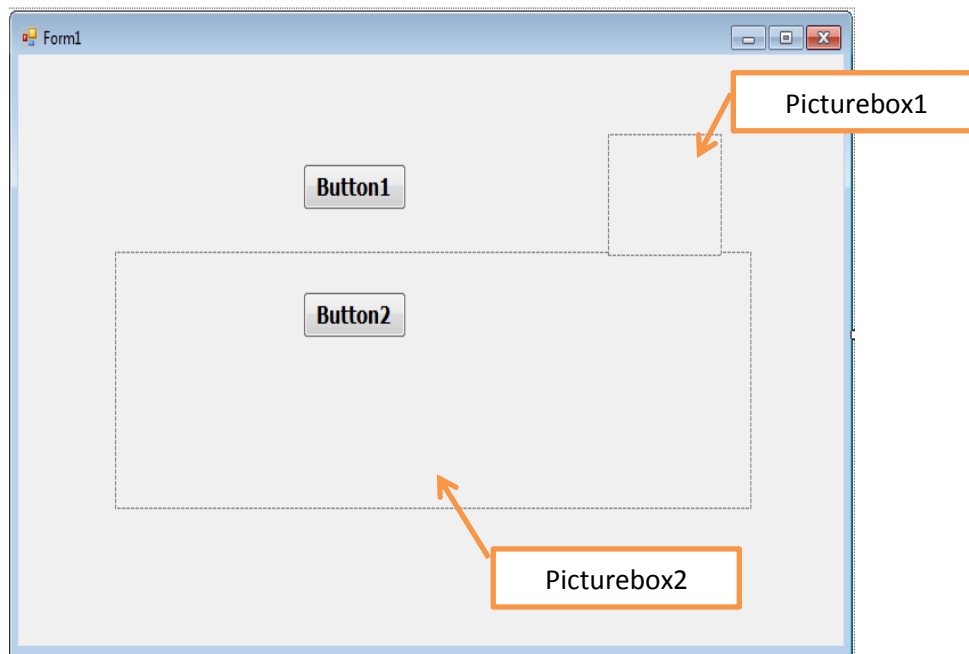
- Record the stages you followed up:

....

....

....

....

- Display your production to your colleagues.
- Discuss your notices and your suggestions.

....

....

....

....

3) Use the previous form window, and the following controls table in adjusting its properties using the shown values in front of each

Controls	Properties	Value
Form1	Text	OR Gate
	BackColor	White
Button1	Text	Off
Button2	Text	Off
PictureBox1	SizeMode	StretchImage
PictureBox2	SizeMode	StretchImage
	Image	"orcircuit.jpg"
	Activate PictureBox2 From the shortcut menu, choose "Send to Back"	

Activity (3)

You can use the code in producing and implementing "The logic OR gate simulation project"

4) Use the following code, of producing the project of" Logic OR gate simulation".

```vb
Private Sub Form1_Load(ByVal sender As Object, ByVal e As System.EventArgs) Handles Me.Load
    Me.PictureBox1.Image = Image.FromFile("off.jpg")
    Me. PictureBox2.Image = Image.FromFile("orcircuit.jpg")
    Me.Button1.Text = "Off"
    Me.Button2.Text = "Off"
End Sub
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
    If Me.Button1.Text = "Off" Then
        Me.Button1.Text = "On"
        Me.PictureBox1.Image= Image.FromFile("on.jpg")
    Else
        Me.Button1.Text = "Off"
        If Me.Button2.Text = "Off" Then
            Me.PictureBox1.Image = Image.FromFile("off.jpg")
        End If
    End If
End Sub
Private Sub Button2_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button2.Click
    If Me.Button2.Text = "Off" Then
        Me.Button2.Text = "On"
        Me.PictureBox1.Image = Image.FromFile("on.jpg")
    Else
```

```
        Me.Button2.Text = "Off"
        If Me.Button1.Text = "Off" Then
            Me.PictureBox1.Image = Image.FromFile("off.jpg")
        End If
    End If
End Sub
```

Implement the previous code to test the project.

Notice:

What happens when you press the buttons alternately?

- Discuss your classmates and your teacher in your notices and suggestions.

....

....

....

....
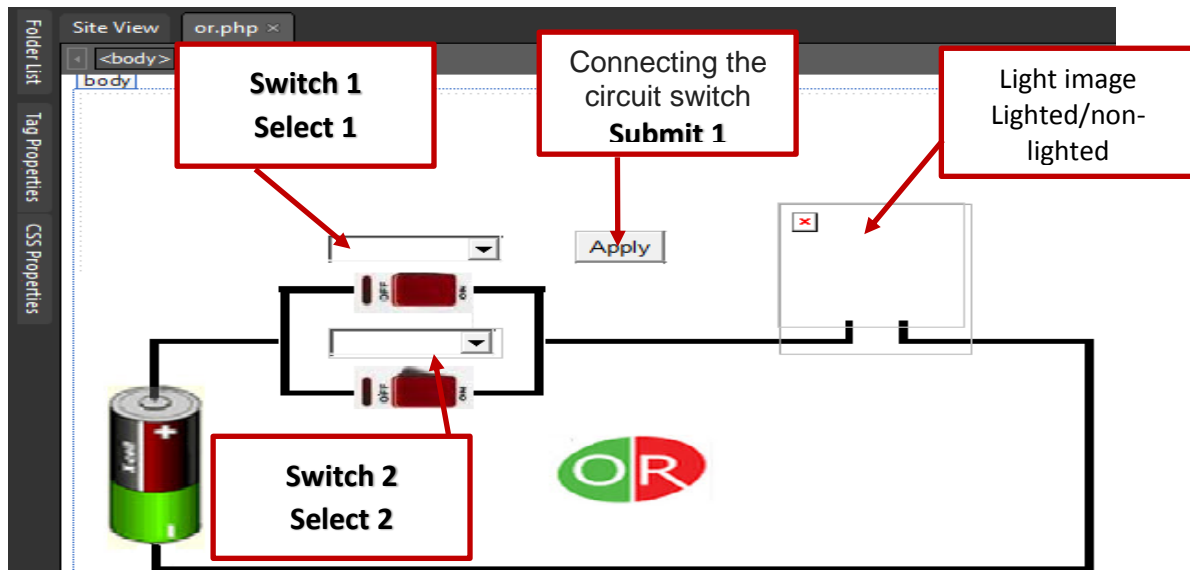
Sixth Subject

Producing a project of logic OR gate in

PHP language

Activity (1)

"Employing PHP code in producing a project that simulates the logic OR gate"

Study the following code, and then answer the questions using the previous figure of the web page:

```
<html >
      <head>
           <meta content="text/html; charset=utf-8" http-
              equiv="Content-Type" />
            <title>OR GATE </title>
      </head>
<body>
      <form method="post"  action=" " >
<?php
      $lightstate="off.jpg";
      $choosekey1="off";
      $choosekey2="off";
      if(isset($_POST['Submit1']))
       {
        $choosekey1=$_POST['Select1'];
```

First: answer the following questions:

- **Choose the correct answer in the following:**

1-The purpose of the code is:---------------------------------

o Adding a selection in "Select1".

o Taking the value of the valuable <u>choosekey1</u>, and adding it to drop down box.

o Specializing the value that is selected from the drop down box to the valuable choosekey1.

```
        $choosekey2=$_POST['Select2'];
    if ($choosekey1=="on" || $choosekey2=="on" )
       {  $lightstate ="on.jpg";   }
     else
       {$lightstate ="off.jpg";}
      }
?>
```

2–Achieving the condition completely in the previous code, leads to the following result . . . .

o Lighted Light appears if the selection "Off" is in both of the two drop down boxes.

o Lighted Light appears if the selection "On" is in one of the two drop down boxes.

o The non–lighted light appears if the selection "Off" is in both of the two drop down boxes.

3– If the condition is not achieved completely, the result will be:. . . . .

o The non–lighted Light appears if one of the two drop down boxes or both of them are "Off".

o Lighted Light appears if the selection "Off" is in both of the two drop down boxes.

o Non lighted Light appears if the selection "Off" is in both of the two drop down boxes.

```
<select name="Select1" style="width: 89px">
<option> on </option>
<option> off </option>
<option selected= 'selected'> <?php echo $choosekey1; ?>
</option>  </select>
```

4- The previous code is of inserting object of one of the following types:........

-   Button   – Text   – CompuBox

5- The default object Select1 selection of the previous code is set through. . .

o The first selection of the object.

o User's selection.

o Variable.

6-The purpose of the previous input code is: . . . .

o Inserting a picture on the web page.

o Inserting an object of a picture type.

o Specializing the variable picture $lightstate.

```
<img alt="" height="164" src="orconector.jpg" width="614" />
</form>
</body>
</html>
```

7- The purpose of the previous img code is: . . . .

o Inserting a picture on the web page.

o Inserting an object of a picture type.

o Specifying the resource of getting the picture.

```
<input name="Image1" type="image"

    height="123" src='<?php echo $lightstate; ?>'

    width="105" />     <br />
```

– Put (√) or (×) in front of each of the following:

- The purpose of the previous code is inserting a button that is written on it "circuit connection". (   )

- The previous code shows that there is no difference between the object name and its type. (   )

```
                 <select name="Select2" style="width: 94px" >
```

```
    <option> on </option>
    <option> off </option>
    <option selected= 'selected'> <?php echo $choosekey2; ?>
    </option>   </select>
    <input name="Submit1" type="submit" value="Apply" />
```

– **Complete:**

– Number of selections in the object that is inserted in the previous code is: .

. . . .

– The purpose of <u>input</u> statement is. . . . .

– The implied PHP code in the previous code types . . . .

Second: Use the following code in implementing the project of logic OR gate simulation on the web page.

```html
<html >
        <head>
                <meta content="text/html; charset=utf-8" http-
                    equiv="Content-Type" />
                <title>OR GATE </title>
        </head>
<body>
        <form method="post"  action=" " >
<?php
        $lightstate ="off.jpg";
        $choosekey1="off";
        $choosekey2="off";
        if(isset($_POST['Submit1']))
         {
          $choosekey1=$_POST['Select1'];
          $choosekey2=$_POST['Select2'];
        if ($choosekey1=="on" || $choosekey2=="on" )
        {  $lightstate ="on.jpg";   }
        else
        {$open="off.jpg";}   }
?>
```

```html
<select name="Select1" style="width: 89px">

<option> on </option>

<option> off </option>

<option selected= 'selected'> <?php echo
$choosekey1; ?> </option>  </select>

<select name="Select2" style="width: 94px" >

<option> on </option>

<option> off </option>

<option selected= 'selected'> <?php echo
$choosekey2; ?> </option>  </select>

input name="Submit1" type="submit"
value="Apply" />

<input name="Image1" type="image"
height="123" src='<?php echo $lightstate; ?>'
width="105" />        <br />

<img alt="" height="164" src="orconector.jpg"
width="614" />

</form>

</body>

</html>
```

Seventh Subject
The Logic NOT gate

Practice (1)

Truth table of the logic NOT gate

Complete the following truth table of NOT gate, which shows all the possibilities of the gate input and output.

A	L
………..	………..
………..	………..

Eighth subject
A project of the logic NOT gate Simulation

Practice (1)

Designing the user interface by using Visual Studio.Net.

Discuss your classmates and your teacher in the following:

Complete:

Firstly: Select the most necessary elements in producing the project of logic gate NOT simulation.

1 . . . .

2 . . . .

Secondly: Select the most important stages of the project implementation.

1 . . . .

2 . . . .

3 . . . .
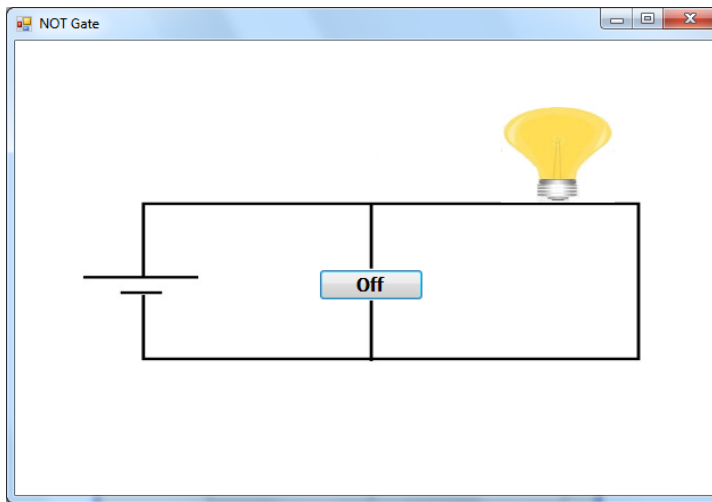
Practice (2)

"Designing the user interface of the project"

Employ your experiences in studying OR&AND gates production, by using Visual Studio application and VB.NET language in producing a project of "operating the logic NOT gate simulation".

Firstly: Notice the proposal figure of the following user's interface:

Answer the following:

(1) Select the most important four controls that are necessary for producing the project.

(A) . . . .

(B) . . . .

(C) . . . .

(D) . . . .

(2) Notice (button1) position; discuss it with your classmates and teacher in the electric circuit.

. . . .

. . . .

. . . .

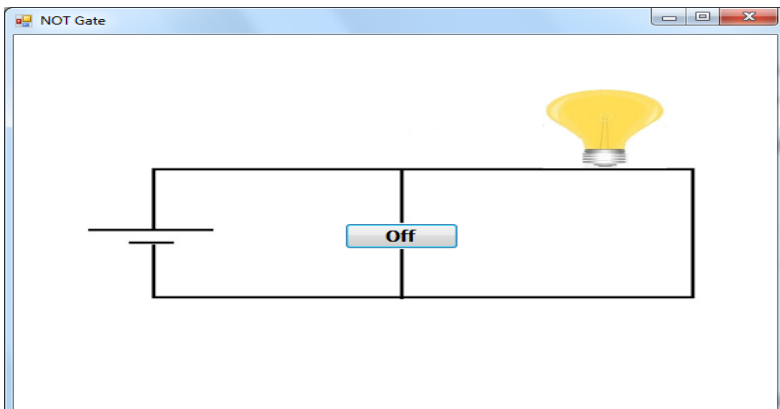. . . . .

Secondly: Implement the previous window design, using your earlier experience in using Visual Basic.Net, then complete the following table:

Controls	Properties	Value
………………………	………………………	………………………
………………………	………………………	………………………
………………………	………………………	………………………
………………………	………………………	………………………

"Adjusting Control's properties"

Thirdly: Use the previous controls table and the form window in adjusting control's properties by the values that are shown in the table.

Record your notices

. . . .

. . . .

Practice (3)

Firstly: Study the following code:

```
Private Sub Form1_Load(ByVal sender As Object, ByVal e As
System.EventArgs) Handles Me.Load

    Me.PictureBox1.Image = Image.FromFile("off.jpg")

    Me.PictureBox2.Image= Image.FromFile("notcircuit.jpg")

    Me.Button1.Text = "On"

End Sub
```

Discuss the following questions with your classmates and teacher, and then complete the table.

no	Questions	Answers
1	How many objects are there in the code?	………………………………
2	What is the procedure name?	………………………………
3	What is the event name of the procedure?	………………………………
4	What is the text that appears on the switch when operating the code?	………………………………

5	What is the file type of the light image?	....
6	What is the file name of the battery image?	....
7	The order <u>ME</u> in the code refers to:	....
8	Do you consider <u>Image</u> is a meathod, a property or an object?	....

Practice (4)

Secondly: Study the following code:

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click

    If Button1.Text = "Off" Then
      Button1.Text = "On"
      Me.PictureBox1.Image = Image.FromFile("off.jpg")
    Else
       Button1.Text = "Off"
       Me.PictureBox1.Image = Image.FromFile("on.jpg")
    End If
End Sub
```

Record your notices then complete the following table with your classmates' help.

no	Questions	Answers
1	What happens if this condition is achieved: "If Button1.Text=Off"	....
2	What happens if this condition is not achieved: "If Button1.Text=Off"	....

3	When is the previous code implemented?	....
4	The previous code is the object's−−−−−−−−−−−−− Choose the correct answer: (Button1−PictureBox1− Button1.Text)	....
5	When can we specialize the lighted light image on.jpg to the PictureBox?	....

Ninth Subject

Producing a project of the logic NOT gate in

PHP language

Activity (1)

"Employing PHP code in producing a project of the logic NOT gate simulation on the web page ".

Employ your previous experience in designing a web page using Expression Web application or PHP language, and inserting necessary controls for producing the project of " logic   NOT gate simulation "that is shown on the following browser window:
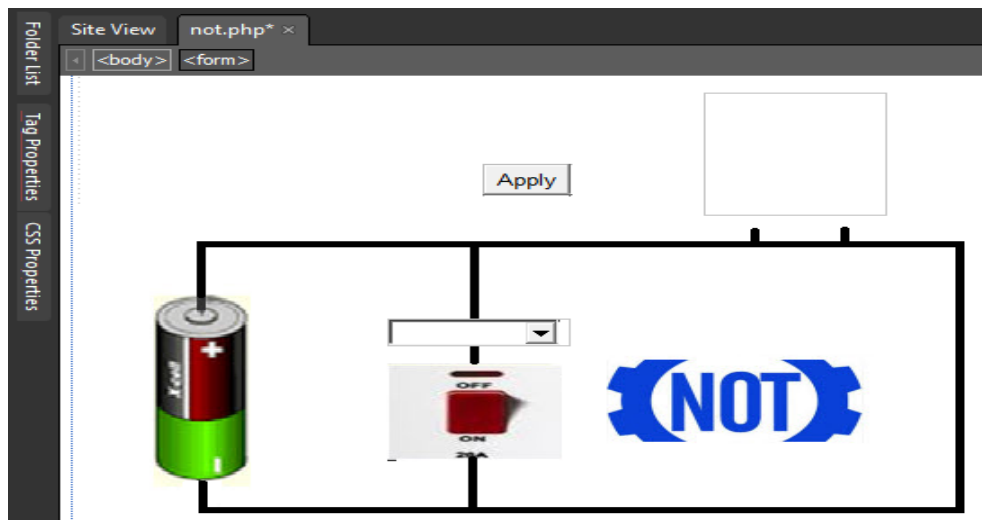
The required: Study the following code, and discuss the following questions with your classmates and teacher:

```
<html>
     <head>
          <meta          content="text/html;          charset=utf-
          8" http-equiv="Content-Type" />
          <title> NOT GATE </title>
     </head>
<body>
     <form method="post"  action=" "   >
<?php
     $lightstate ="off.jpg";
     $choosekey1="on";
     if(isset($_POST['Submit1']))
      {
       $choosekey1=$_POST['Select1'];
       if ($choosekey1=="off")
         { $lightstate ="on.jpg"; }
       else
         { $lightstate ="off.jpg"; }
      }
?>
```

Choose the correct answer in the following questions:

1- The purpose of the last IF statement is testing the user's selection in case of:

-The selection "ON" shows the lighted light image.

-The selection "OFF" shows the lighted light image.

-The selection "OFF" shows the non-lighted light image.

```
 

  <select name="Select1" style="width: 94px" >

  <option> off </option>

  <option> on </option>

  <option selected='selected'> <?php echo $choosekey1; ?>
  </option>    </select>
```

2-The purpose of the code <?Php echo $lightstate:?> in the last Option statement:

– Inserting choosekey1 object in drop-down list.

– Printing variable contentchoosekey1 on the internet browser window.

– Assign the user's choice from the drop-down list to choosekey1 variable.

```
        <input name="Submit1" type="submit"
         value="Apply" />
        <input name="Image1" type="image"
         height="123" src='<?php echo $lightstate; ?>'
         width="105" />          <br />
        <img alt="" height="164" src="notconectnot_.jpg"
         width="431" />
</form>
</body>
</html>
```

3- The purpose of the code <?php echo $lightstate:?> in the last input statement:

- Printing the lighted light image.

- Printing the light image (lighted-or non-lighted) according to the choice that

  is selected before.

Tenth subject
Employing Logic gates in life taking-decisions

Activity (1)

Applications on" Employing Logic gates in life taking−decisions"

We take a lot of decisions in our daily life, some of them are simple decisions, and the other are complex, these decisions depend on their Inputs and the determinants of the problem that we face , the outputs we desire to achieve ,and how to predict the possibilities of their achieving.

In the following, we have some simple situations and examples that we can face in our life:

The required:

Study the following applications, then answer the questions, and complete the following table to each state:

First application

The Ministry of Education announced the free grant for the students of the secondary school level during the Summer Holidays for training on computers maintenance.

It is required from the student to be accepted that the overall total marks are more than 97%, and obtaining a 99% in computer material & information technology.

The required:

Firstly: Choose the correct answer in each of the following:

(1) The logic gate name that represents the state is (AND– OR –NOT).

(2) Choose the logic code that represents the logic gate in the previous state:

A)   (B)   (C)
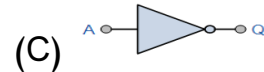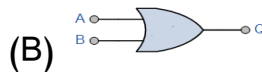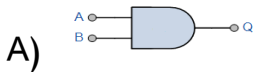
3) The number of forms (possibilities) in the previous state is (2–4–8).

4) The correct Boolean formula that expresses the state is:

a) **Y=A**   (B) **Y=A+B**   (C) **Y=A.B**

Secondly: Complete the following truth table of the state:

A	B	Y

Second application

You have a generator operates automatically when power cuts, and it disconnect automatically when electric current GP returns.

Co-operate with your classmates under the supervision of your teacher in the state analysis and answering the questions of the following table:

Question	Answer
(1) What is the logic gate name that expresses the state?	
(2) Draw the logic gate that represents the state?	
(3) Write the Boolean formula of the gate.	
(4) Draw the truth table of the logic gate that represents the state.	

Third application

The distribution of agricultural land on youth was announced as a contribution of the state in solving the problem of unemployment, one of the following conditions at least have to be applied on the applicant.

− To be from the governorate.

− Graduate from the faculty of agriculture.

Co−operate with your classmates under the supervision of your teacher in the state analysis and answer the questions of the following table:

Question	Answer
(1) Draw the logic gate that represents the state and put its name.	
(2) Write the Boolean formula of the gate.	
(4) Draw the truth table of the logic gate that represents the state.	

Fourth application

One of the governorate distributes small projects for young graduates; the project is devoted to the people of neighborhood of medium qualifications and age less than 30 years.

Required: Answer the questions in the following table after studying and analyzing the state:

Question	Answer
(1) Draw the logic gate that represents the state? Showing its name?	
(2) Write the Boolean formula of the gate.	
(3) Count the number of forms in the state.	
(4) Draw the truth table of the logic gate that represents the state.	

Done by God's goodness