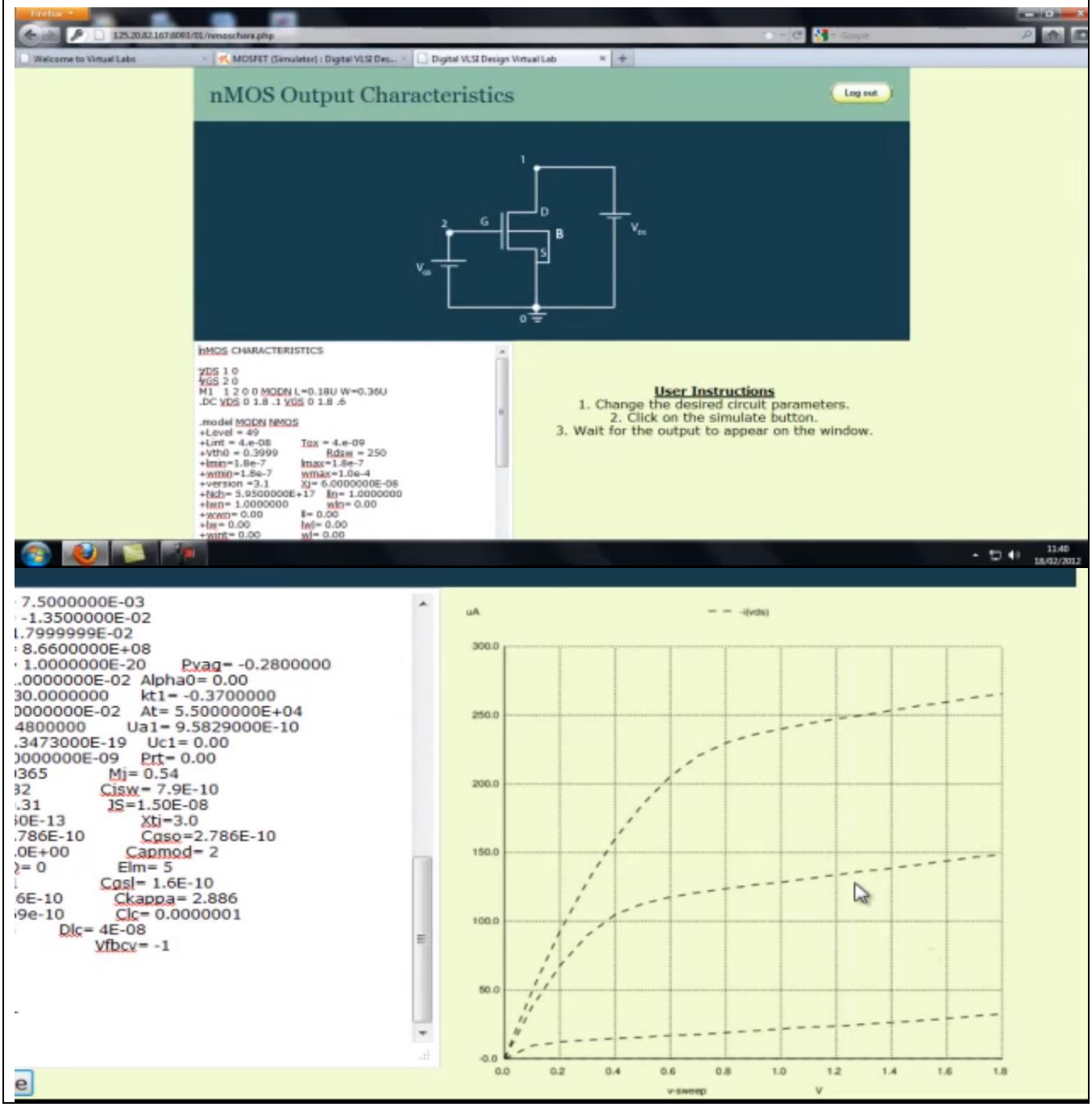
DAILY ASSESSMENT FORMAT

Date:	13th June 2020	**Name:**	Soundarya NA
Course:	VLSI	**USN:**	4AL16EC077
Topic:	VLSI	**Semester & Section:**	8th - B

FORENOON SESSION DETAILS

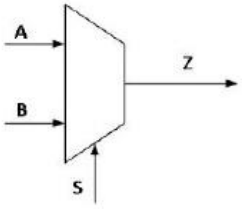
Image of session



Report:

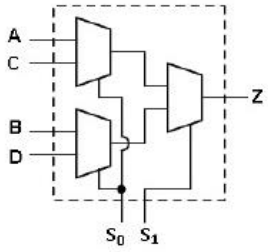
4:1 MUX:

A multiplexer or mux is a combinational circuit that selects several analog or digital input signals and forwards the selected input into a single output line. A multiplexer of 2n inputs has n selected lines, are used to select which input line to send to the output.



$$Z = (A.\bar{S}) + (B.S)$$

S	A	B	Z
0	0	0	0
	0	1	0
	1	0	1
	1	1	1
1	0	0	0
	0	1	1
	1	0	0
	1	1	1



$$Z = (A.\bar{S}_0.\bar{S}_1) + (B.\bar{S}_0.S_1) + (C.S_0.\bar{S}_1) + (D.S_0.S_1)$$

MOSFET:

The metal–oxide–semiconductor field-effect transistor (MOSFET) is a transistor used for amplifying or switching electronic signals. In MOSFETs, a voltage on the oxide-insulated gate electrode can induce a conducting channel between the two other contacts called source and drain. The channel can be of n-type or p-type, and is accordingly called an nMOSFET or a pMOSFET. Figure 1 shows the schematic diagram of the structure of an nMOS device before and after channel formation.

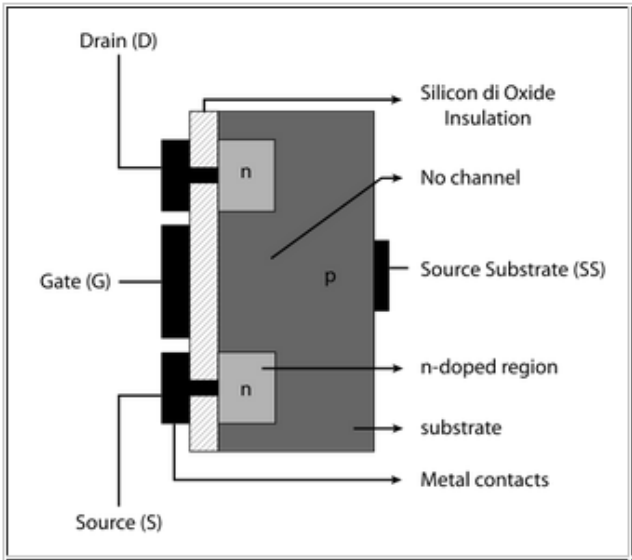


Fig. (1a): nMOSFET before channel formation

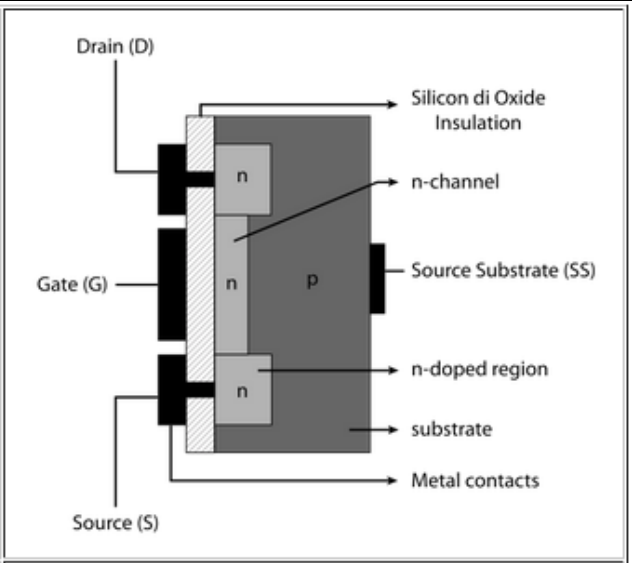
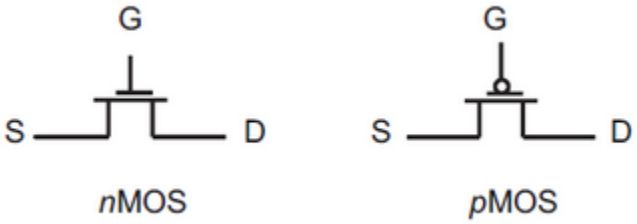


Fig. (1b): nMOSFET structure after channel formation

Circuit symbols:



Output Characteristics:

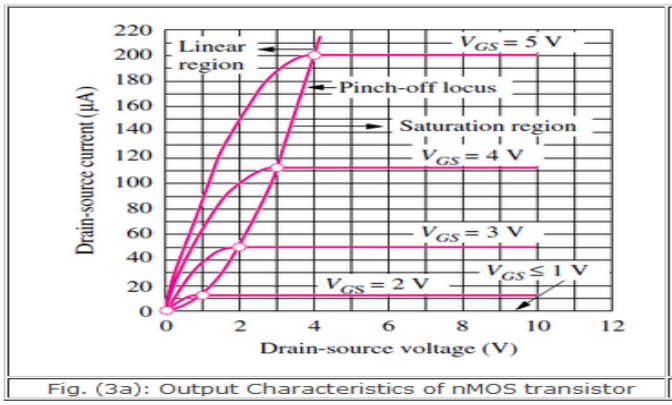


Fig. (3a): Output Characteristics of nMOS transistor

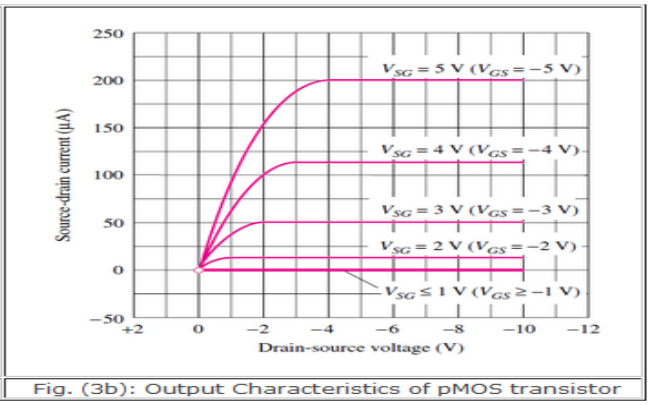


Fig. (3b): Output Characteristics of pMOS transistor

The characteristics of an nMOS transistor can be explained as follows. As the voltage on the top electrode increases further, electrons are attracted to the surface. At a particular voltage level, which we will shortly define as the threshold voltage, the electron density at the surface exceeds the hole

density. At this voltage, the surface has inverted from the p-type polarity of the original substrate to an n-type inversion layer, or inversion region, directly underneath the top plate as indicated in Fig. This inversion region is an extremely shallow layer, existing as a charge sheet directly below the gate. In the MOS capacitor, the high density of electrons in the inversion layer is supplied by the electron–hole generation process within the depletion layer. The positive charge on the gate is balanced by the combination of negative charge in the inversion layer plus negative ionic acceptor charge in the depletion layer. The voltage at which the surface inversion layer just forms plays an extremely important role in field-effect transistors and is called the threshold voltage Vtn. The region of output characteristics where VGStn and no current flows is called the cutt-off region. When the channel forms in the nMOS (pMOS) transistor, a positive (negative) drain voltage with respect to the source creates a horizontal electric field moving the electrons (holes) toward the drain forming a positive (negative) drain current coming into the transistor. The positive current convention is used for electron and hole current, but in both cases electrons are the actual charge carriers. If the channel horizontal electric field is of the same order or smaller than the vertical thin oxide field, then the inversion channel remains almost uniform along the device length. This continuous carrier profile from drain to source puts the transistor in a bias state that is equivalently called either the non-saturated, linear, or ohmic bias state. The drain and source are effectively short-circuited. This happens when VGS > VDS + Vtn for nMOS transistor and VGS < VDS +Vtp for pMOS transistor. Drain current is linearly related to drain-source voltage over small intervals in the linear bias state.

CMOS inverter:

The inverter is universally accepted as the most basic logic gate doing a Boolean operation on a single input variable. Fig.1 depicts the symbol, truth table and a general structure of a CMOS inverter. As shown, the simple structure consists of a combination of an pMOS transistor at the top and a nMOS transistor at the bottom.

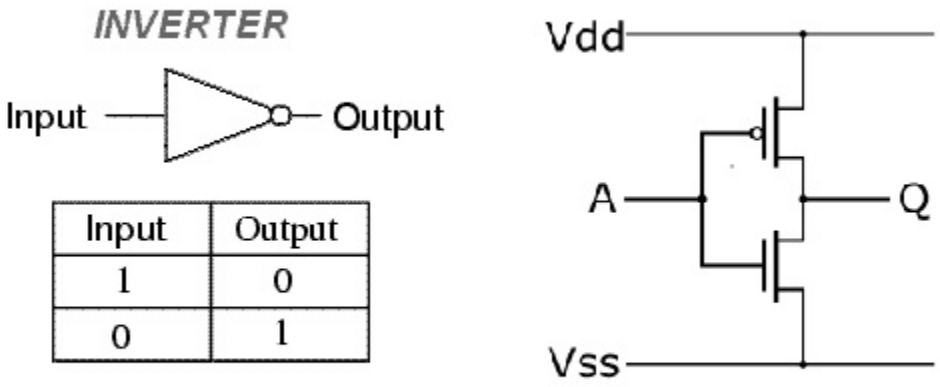
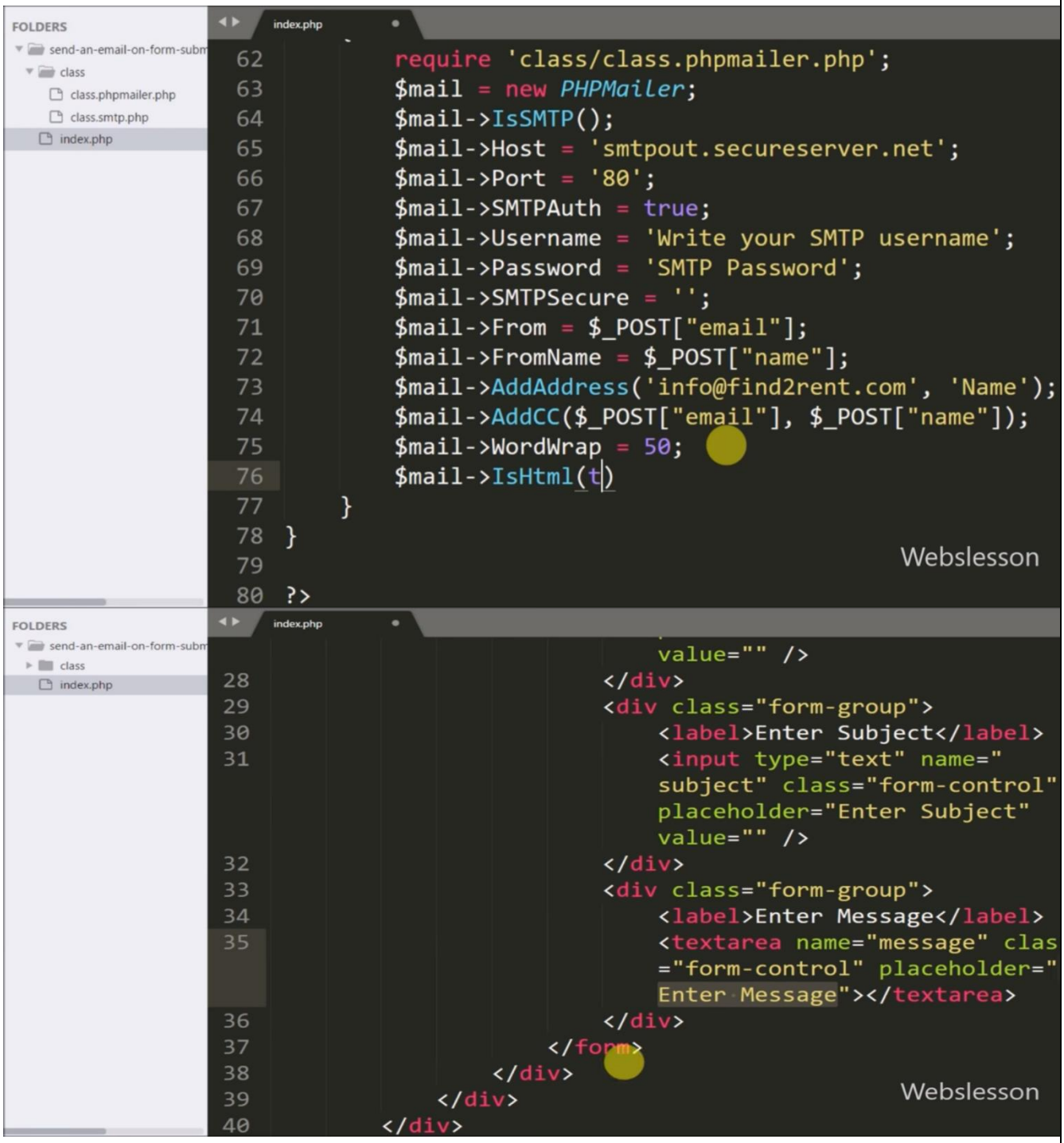


Fig.1: Symbol, circuit structure and truth table of a CMOS inverter

CMOS is also sometimes referred to as complementary-symmetry metal–oxide–semiconductor . The words "complementary-symmetry" refer to the fact that the typical digital design style with CMOS uses complementary and symmetrical pairs of p-type and n-type metal oxide semiconductor field effect transistors (MOSFETs) for logic functions. Two important characteristics of CMOS devices are high noise immunity and low static power consumption. Significant power is only drawn while the transistors in the CMOS device are switching between on and off states. Consequently, CMOS devices do not produce as much waste heat as other forms of logic, for example transistor-transistor logic (TTL) or NMOS logic, which uses all n-channel devices without p-channel devices.

Date:	13th June 2020	Name:	Soundarya NA
Course:	UDEMY	USN:	4AL16EC077
Topic:	MySQL	Semester & Section:	8th - B

Image:



Report:

Code:

```
<?php
// the message
$msg = "First line of text\nSecond line of text";

// use wordwrap() if lines are longer than 70 characters
$msg = wordwrap($msg,70);

// send email
mail("someone@example.com","My subject",$msg);
?>
```

Code:

```
<?php
$to = "somebody@example.com";
$subject = "My subject";
$txt = "Hello world!";
$headers = "From: webmaster@example.com" . "\r\n" .
"CC: somebodyelse@example.com";

mail($to,$subject,$txt,$headers);
?>
```

Code:

```
<?php
$to = "somebody@example.com, somebodyelse@example.com";
$subject = "HTML email";

$message = "
<html>
```

```
<head>
<title>HTML email</title>
</head>
<body>
<p>This email contains HTML Tags!</p>
<table>
<tr>
<th>Firstname</th>
<th>Lastname</th>
</tr>
<tr>
<td>John</td>
<td>Doe</td>
</tr>
</table>
</body>
</html>
";

// Always set content-type when sending HTML email
$headers = "MIME-Version: 1.0" . "\r\n";
$headers .= "Content-type:text/html;charset=UTF-8" . "\r\n";

// More headers
$headers .= 'From: <webmaster@example.com>' . "\r\n";
$headers .= 'Cc: myboss@example.com' . "\r\n";

mail($to,$subject,$message,$headers);
?>
```

Code:

```
<html>


  <head>
    <title>Hello World</title>
  </head>


  <body>
    <?php echo "Hello, World!";?>
  </body>


</html>
```

Output:

Hello, World!