



VISION

(BOR Resolution No. 25 s. 2016)

A premier state university with recognized excellence in engineering and technology education at par with leading universities in the ASEAN region.

MISSION

(Section 2 of P.D. No. 1518)

The University shall provide higher and advanced vocational, technical, industrial, technological and professional education and training in industries and technology and in practical arts leading to certificates, diplomas and degrees. It shall provide progressive leadership in applied research, developmental studies in technical, industrial, and technological fields and production using indigenous materials; effect technology transfer in the countryside; and assist in the development of small-and-medium scale industries in identified growth centers.

DEPARTMENT OF INDUSTRIAL EDUCATION GOALS

1. To periodically review the curricular program to produce competent and committed teachers.
2. To undertake development and innovative researchers in Industrial Education.
3. To facilitate transfer of technology in Industrial Education through expanded and effective linkages with industry and other sectors.
4. To produce teachers who understand and appreciate genuine human ideas and values.
5. To imbue prospective teachers with desirable characteristics.

OBJECTIVES

1. Offer relevant and responsive curricular programs.
2. Initiate the conduct of researches in pedagogy and related educational technology.
3. Intensify community involvement through extension programs and projects.
4. Develop attitude, personal discipline, moral, social and cultural values of the students.
5. Equip prospective teachers with desirable personal and social characteristics, qualities and traits.



Management
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REPUBLIC OF THE PHILIPPINES TECHNOLOGICAL UNIVERSITY OF THE PHILIPPINES CAVITE CAMPUS

Carlos Q. Trinidad Avenue, Salawag, Dasmariñas City, Cavite, Philippines

Telefax: (046) 416-4920

Email: cavite@tup.edu.ph | Website: www.tup.edu.ph

BTVTED

AREA III

CURRICULUM AND INSTRUCTION

C. Assessment of Academic Performance

SYSTEM – INPUTS AND PROCESSES



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BTVTED

AREA III

CURRICULUM AND INSTRUCTION

C. Assessment of Academic Performance

S.1. The program of studies has a system of evaluating student performance through a combination of the following:

S.1.1. formative tests such as quizzes, units tests;

W6 - LONG EXAM

PROG5: Device Programming

Name: PRIYOR, JONATHAN P.

Section: BTTE - CP - 3P

Date: 10/25/22

97

Day 2 - LABORATORY - Long Examination Electronic Components

points	No.	Component	Specification (s)	Function (s)
2	-	RESISTOR	22PCS- 11pcs- 220 ohms 11 - different resistor	to limit the flow of electric current
4	1	Arduino	1 pc - Arduino Uno 1 pc - Arduino Mega	used to create prototypes
3	2	Multitester	1 pc	test the electronic components
4	3	Breadboard	1 pc - small 1 pc - big	used to test the circuit without soldering any components
6	4	PCB	1 pc - Universal (2cm x 8cm) 1 pc - Universal (5cm x 7cm) 1 pc - Universal (3cm x 7cm) 1 pc - Copper	used to install electronic components / used to build electronic circuits.
6	5	BATTERY	2 pcs - AA 2 pcs - AAA 2 pcs - Coin cell 1 pc - 9v batt	provides electricity to components. Acts as source
3	6	Buzzer/Speaker	1 pc	used to output sound

W6 - LONG EXAM

PROG5: Device Programming

7	7	LEDs	1pc - blue	emits light when passed by electricity
			1pc - Yellow	
			1pc - Red	
			1pc - Green	
			1pc - RGB White	
3	8	potentiometer	2pcs - B10K	a variable resistor. adjustable
4	9	Capacitor	1pc - electrolytic (470uf)	stores electricity
			1pc - ceramic	
3	10	LED	1pc - RGB	emits light (RGB) when ^{electricity is} supplied
4 3	11	Transistors	3pcs - BC557	manipulates the flow of electricity.
			1pc - CNN 557	
5 3	12	switches/ buttons	1pc - lever switch	emits signal when pressed or switched.
			1pc - slider switch	
			2pc - button	
3	13	DC Motor	1pc	rotates/spin when ^{electricity is} supplied
3	14	Diode	2pcs	restricts the flow of electricity to 1 direction
3	15	Photoresistor Photoresistor	1pc	detects light changes
3	16	LED display	1pc - 8 segment	displays 0-9 digits
4	17	connecting wire	1pc - Male - Male	used to have the electricity to flow
			1pc - Female - Female	

W6 – LONG EXAM

PROG5: Device Programming

Parts of Arduino

No.	Parts	No.	Parts
1	Reset Button	6	IC SP
2	Barrel Jack	7	Main Micro Controller
3	Power LED	8	Power USB
4	Digital Pins Analog Reference	9	Voltage Regulator
5	Digital Pins	10	Crystal Oscillator

Resistor Values

Points	NO.	BAND NO.	COLOR	VALUE
5 ✓	1	1	RED	2 ✓
		2	RED	2 ✓
		3	BROWN	2200 (220) ✓
		4	GOLD	±5% ✓
220 ~ 2200 ±5% ✓				
5 ✓	2	1	BROWN	1 ✓
		2	BLACK	0 ✓
		3	RED	100 ✓
		4	GOLD	±5% ✓
1000 ~ ±5% ✓				
5 ✓	3	1	BROWN	1 ✓
		2	BLACK	0 ✓
		3	ORANGE	1K ✓
		4	GOLD	±5% ✓
10000 ~ ±5% ✓				
5 ✓	4	1	RED	2 ✓
		2	BLACK	0 ✓
		3	ORANGE	1K ✓
		4	GOLD	±5% ✓
20000 ~ ±5% ✓				

W6 – LONG EXAM

PROG5: Device Programming

Name: JHONA VALLETERO

Section: BITE - CP - 3A

Date: Oct. 25 2022

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Day 2 – LABORATORY – Long Examination

Electronic Components

points	No.	Component	Specification (s)	Function (s)
2	-	RESISTOR	22PCS- 11pcs- 220 ohms 11 - different resistor	to limit the flow of electric current
4	1	Arduino Board	1 pcs. Arduino Mega 2560 1 pcs. Arduino Uno	an open-source platform used for building electronic projects
3	2	Multimeter	UT33C1 / 1pcs.	to measure current, voltage, & resistance
4	3	Breadboard	Large Small	for prototyping electronics
6	4	Breadboard	4 pcs Small 	for prototyping electronics
6	5	Battery	7 pcs 2 pcs of 1.5 V Battery AA 2 pcs of 1.5 V Battery AAA Coin cell battery 3V (2pcs) 6F22 9V Battery	source of energy
3	6	Resistor Capacitor LED	1 pc.	limit the flow of electric current

W6 - LONG EXAM

PROG5: Device Programming

7	7	LED	1 pc. Red	converts electric energy into direct light
			1 pc. Yellow	
			1 pc. Blue	
			1 pc. White	
			1 pc. Green	
3	8	potentiometer	2 pieces / 1 Blok	as voltage dividers
4	9	Capacitor	1 pc. Polarized Capacitor 16V	
			100 pcs. 104M	
3	10	LED RGB	1 pcs.	produces almost any color
4	11	Transistor	3 pcs. small	to control the flow of power to another parts of the circuit
			1 pc. large	
5	12	Push Button Slideswitch	2 pcs. Pushbutton	to turn on and off the control circuit
			1 pcs. Slideswitch	
			4 pcs.	
3	13			
3	14	Diode	2 pcs.	to control the direction of current-flow
3	15	Photoresistor	1 pcs.	to measure light intensity
3	16			
4	17	Wire	2 pcs.	for connecting
				

W6 – LONG EXAM

PROG5: Device Programming

Parts of Arduino

No.	Parts	No.	In-Circuit Parts
1	Arduino Reset	6	In-Circuit Serial Programming
2	Power (Barrel Jack)	7	Main Microcontroller
3	Power LED Indicator	8	Power USB
4	AREF	9	Voltage Regulator
5	Digital I/O	10	Crystal Oscillator

Resistor Values

Points	NO.	BAND NO.	COLOR	VALUE
5	1	1	RED	2
		2	RED	2
		3	BROWN	$\times 10$
		4	GOLD	$\pm 5\%$
220 Ohms $\pm 5\%$				
5	2	1	BROWN	1
		2	BLACK	0
		3	RED	$\times 100$
		4	GOLD	$\pm 5\%$
1k Ohms $\pm 5\%$				
5	3	1	BROWN	1
		2	BLACK	0
		3	ORANGE	$\times 1k$
		4	GOLD	$\pm 5\%$
10k Ohms $\pm 5\%$				
5	4	1	RED	2
		2	BLACK	0
		3	ORANGE	$\times 1k$
		4	GOLD	$\pm 5\%$
20k Ohms $\pm 5\%$				

220 Ohms $\pm 5\%$

10 \times 1000

W6 - LONG EXAM

PROG5: Device Programming

Name: JASPER RALLEN S. ANGELES

Section: NTE - CP - 2A

Date: 10-25-22

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Day 2 - LABORATORY - Long Examination Electronic Components

points	No.	Component	Specification (s)	Function (s)
2	-	RESISTOR	22PCS- 11pcs- 220 ohms 11 - different resistor	to limit the flow of electric current
4	1	ARDUINO	Arduino Mega 1pc Arduino Uno 1pc	FOR BUILDING PROTOTYPE electronic PROJECTS
3	2	MULTIMETER	1 pc of multi meter	to measure the voltage
3	3	BREADBOARD	2PCS OF Breadboard 2 different bread board	FOR BUILDING A PROTOTYPE electronics
4	5	CELL BATTERY (CMOS)	2PCS OF CMOS	CONTAINS ELECTRICAL POWER THAT GIVE A PUSH OF VOLTAGE
6	4	9V BATTERY	1pc of 9V	
		1.5 BATTERY	2PCS OF DOUBLE A	
		TRIPLE A 1.5 BATTERY	2PCS OF TRIPLE A	
3	4	PCB	3cm x 7cm 2cm x 6cm 	PROTOTYPING FOR electronics
3	6	DIODE X	1PC X	CONTROL THE ENERGY FLOW

W6 - LONG EXAM

PROG5: Device Programming

7	7	LED	yellow LED 1pc BLUE LED 1pc RED LED 1pc Green LED 1pc WHITE LED 1pc	CONVERT ELECTRICAL ENERGY INTO LIGHT
0 3	8	sensor X	2 pc X	
3 4	9	CAPACITOR	2 pc CAPACITOR ceramic electrolytic X 2 different capacitors	CONTROL THE FLOW OF ELECTRICAL ENERGY IN CIRCUIT
3	10	LED RGB	1 pc	CAN TURN IN ANY COLOR
0 4	11	Transistor POLARIZED CAPACITOR X	4 pcs X polarized 2 DIFFERENT CAPACITOR X	CONTROL THE FLOW OF ELECTRICITY IN CIRCUIT
3 5	12	SLIDESWITCH PUSH BUTTON SWITCH	1 pc X 2 pc OF push button 1 pc X	TURN ON AND OFF THE CIRCUIT CONTROL
3	13	DC MOTOR	1 pc DC motor	WHEN GIVEN A POWER THE DIRECTION IS ROTATION MOTOR
3	14	DIODE	2 pc diode	CONTROL THE FLOW OF ENERGY
2 3	15	PHOTORESISTOR	1 pc	X CONTROL THE FLOW OF ENERGY
0 3	16	DIGITAL clock X	1 pc X	TO COUNT THE TIME X
3 4	17	wires	2 pcs OF wire 2 different type X	CONNECT TO COMPONENTS

W6 – LONG EXAM

PROG5: Device Programming

Parts of Arduino

No.	Parts	No.	Parts
1	RESET SWITCH	6	ICSP
2	POWER PORT	7	MAIN MICROCONTROLLER
3	TX RX LED	8	USB CONNECTOR
4	ANALOG AREF	9	VOLTAGE REGULATOR
5	DIGITAL PINS	10	CRYSTAL OSCILLATOR

Resistor Values

Points	NO.	BAND NO.	COLOR	VALUE
5	1	1	RED	2
		2	RED	2
		3	BROWN	$\times 10$
		4	GOLD	$\pm 5\%$
220 Ω $\pm 5\%$				
5 3	2	1	BROWN	1
		2	BLACK	0
		3	RED	$\times 100$
		4	GOLD	$\pm 2\%$
1000 Ω $\pm 2\%$				
5	3	1	BROWN	1
		2	BLACK	0
		3	ORANGE	$\times 1K$
		4	GOLD	$\pm 5\%$
10000 Ω $\pm 5\%$				
5	4	1	RED	2
		2	BLACK	0
		3	ORANGE	$\times 1K$
		4	GOLD	$\pm 5\%$
20000 Ω $\pm 5\%$				

W6 – LONG EXAM PROG5: Device Programming

Name: JHONA D. VALLESTERO

Section: BITE-CP-3A

Date: October 26, 2022

Day 3 – LABORATORY – Long Examination Number System

Instructions: Using the ASCII Alphabet, Solve and decode the problem. Show your solutions.

5pts per Solution; 10pts- Decoded Table Total Points: 50pts

ASCII Alphabet Characters

Symbol	Decimal	Binary
A	65	01000001
B	66	01000010
C	67	01000011
D	68	01000100
E	69	01000101
F	70	01000110
G	71	01000111
H	72	01001000
I	73	01001001
J	74	01001010
K	75	01001011
L	76	01001100
M	77	01001101
N	78	01001110
O	79	01001111
P	80	01010000
Q	81	01010001
R	82	01010010
S	83	01010011
T	84	01010100
U	85	01010101
V	86	01010110
W	87	01010111
X	88	01011000
Y	89	01011001
Z	90	01011010

Symbol	Decimal	Binary
a	97	01100001
b	98	01100010
c	99	01100011
d	100	01100100
e	101	01100101
f	102	01100110
g	103	01100111
h	104	01101000
i	105	01101001
j	106	01101010
k	107	01101011
l	108	01101100
m	109	01101101
n	110	01101110
o	111	01101111
p	112	01110000
q	113	01110001
r	114	01110010
s	115	01110011
t	116	01110100
u	117	01110101
v	118	01110110
w	119	01110111
x	120	01111000
y	121	01111001
z	122	01111010

Reference: ASCII Alphabet Characters
(kerryr.net)

- $(61)_{16} = 01100001_2 \neq a$
- $(145)_8 = 101_{10} \neq e$
- $(114)_{10} = 1110010_2 \neq r$
- $(147)_8 = 67_{16} \neq g$
- $(116)_{10} = 164_8 \neq t$
- $(01011001)_2 = 131_8 \neq y$
- $(01001111)_2 = 4f_{16} \neq o$
- $(55)_{16} = 85_{10} \neq u$

y	o	u		a	r	e		g	r	e	a	t
6	7	8		1	3	2		4	3	2	1	5

$$100 + 5 = 105$$

excess 5
points will be
added to
participation

+5 early
submission

100

8
10
32
15
20
15
100

10

W6 – LONG EXAM

PROG5: Device Programming

1. $(61)_{16} = \underline{01100001}_2$

	8	4	2	1
6	0	1	1	0
1	0	0	0	1

4

2. $(145)_8 = \underline{101}_{10}$

$5 \times 8^0 = 5 \times 1 = 5$

$4 \times 8^1 = 4 \times 8 = 32$

$1 \times 8^2 = 1 \times 64 = 64$

$\underline{101}_{10}$

4

3. $(114)_{10} = \underline{1110010}_2$

	64	32	16	8	4	2	1
114	1	1	1	0	0	1	0

4

4. $(147)_8 = \underline{67}_{16}$

1st step:

$7 \times 8^0 = 7$

$4 \times 8^1 = 32$

$1 \times 8^2 = 64$

$\underline{103}_{10}$

2nd step:

$16 \overline{) 103}$

$6 - 7$

67_{16}

4

5. $(116)_{10} = \underline{164}_8$

$8 \overline{) 116}$
 $8 \overline{) 14 - 4}$
 $1 - 6$

164_8

4

6. $(01011001)_2 = \underline{131}_8$

4	2	1	4	2	1	4	2	1
0	0	1	0	1	1	0	0	1

131_8

4

7. $(01001111)_2 = \underline{4f}_{16}$

8	4	2	1	8	4	2	1
0	1	0	0	1	1	1	1

4

15

$4F_{16}$

4

8. $(55)_{16} = \underline{85}_{10}$

$5 \times 16^0 = 5 \times 1 = 5$

$5 \times 16^1 = 5 \times 16 = 80$

$\underline{85}_{10}$


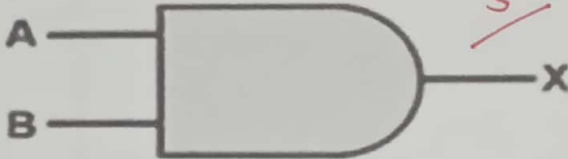
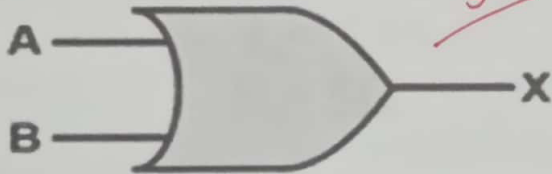
4

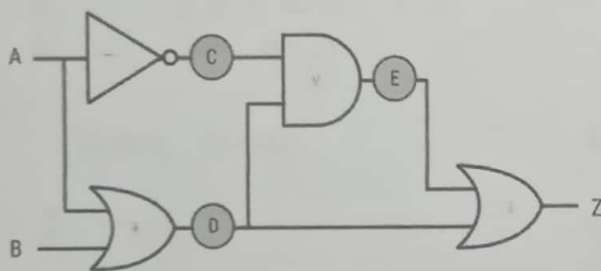
W6 – LONG EXAM

PROG5: Device Programming

Logic Gates

Identify each of these logic gates by name, and complete their respective truth tables. 5pts each gates; Total pts: 35pts

Gate	Symbol	Rule
NOT Gate		$0 \rightarrow 1$ $1 \rightarrow 0$
AND Gate		$00 \rightarrow 0$ $01 \rightarrow 0$ $10 \rightarrow 0$ $11 \rightarrow 1$
OR Gate		$00 \rightarrow 0$ $01 \rightarrow 1$ $10 \rightarrow 1$ $11 \rightarrow 1$



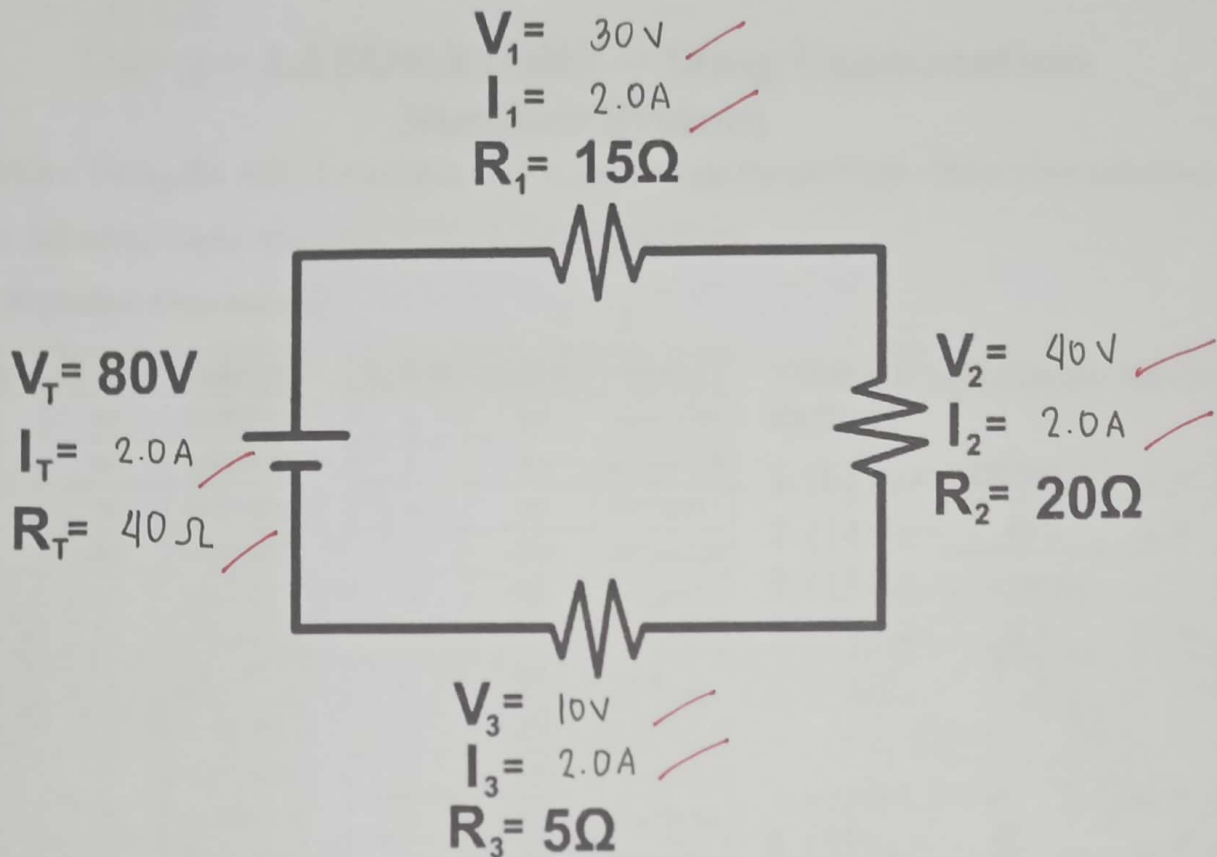
15 20

Input A	Input B	C	D	E	Output Z
A	B	\bar{A}	$A + B$	$C \times D$	$E + D$
0	0	1	0	0	0
0	1	1	1	1	1
1	0	0	1	0	1
1	1	0	1	0	1

W6 – LONG EXAM PROG5: Device Programming

Circuit

Calculate what is missing from the series circuit. Show your solution. Total pts: 15pts



Total Resistance

$$R_T = R_1 + R_2 + R_3$$

$$R_T = 15\Omega + 20\Omega + 5\Omega$$

$$R_T = 40\Omega$$

Finding Current

$$I = \frac{V}{R}$$

$$I = \frac{80\text{ V}}{40\Omega}$$

$$I = 2.0\text{ A}$$

Voltage Drop

$$V_1 = 2.0\text{ A} \times 15\Omega$$

$$V_1 = 30\text{ V}$$

$$V_2 = 2.0\text{ A} \times 20\Omega$$

$$V_2 = 40\text{ V}$$

$$V_3 = 2.0\text{ A} \times 5\Omega$$

$$V_3 = 10\text{ V}$$

$$V_T = 30\text{ V} + 40\text{ V} + 10\text{ V}$$

$$V_T = 80\text{ V}$$

} checking

86 + 5 = 91 + 5
 +5 early submission
 F.S.: 96

5
 10
 28
 15
 19
 14
 86 91

W6 – LONG EXAM
 PROG5: Device Programming
 Name: PASTOR, JONATHAN P.
 Section: BTTE CP 3A
 Date: 10/26/22

Day 3 – LABORATORY – Long Examination
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J	74	01001010
K	75	01001011
L	76	01001100
M	77	01001101
N	78	01001110
O	79	01001111
P	80	01010000
Q	81	01010001
R	82	01010010
S	83	01010011
T	84	01010100
U	85	01010101
V	86	01010110
W	87	01010111
X	88	01011000
Y	89	01011001
Z	90	01011010

Symbol	Decimal	Binary
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b	98	01100010
c	99	01100011
d	100	01100100
e	101	01100101
f	102	01100110
g	103	01100111
h	104	01101000
i	105	01101001
j	106	01101010
k	107	01101011
l	108	01101100
m	109	01101101
n	110	01101110
o	111	01101111
p	112	01110000
q	113	01110001
r	114	01110010
s	115	01110011
t	116	01110100
u	117	01110101
v	118	01110110
w	119	01110111
x	120	01111000
y	121	01111001
z	122	01111010

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 (kerryr.net)

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- $(145)_8 = 101_{10} \neq e$
- $(114)_{10} = 1110010_2 \neq r$
- $(147)_8 = 67_{16} \neq g$
- $(116)_{10} = 161_8 = t$
- $(01011001)_2 = 11_8 = y$
- $(01001111)_2 = 45_{16} = o$
- $(55)_{16} = 85_{10} \neq u$

y	o	u		a	r	e		g	r	e	a	t
6	7	8		1	3	2		4	3	2	1	5

10

W6 - LONG EXAM

PROG5: Device Programming

1. $(61)_{16} = \underline{1100001}_2$

$$1 \times 16^0 = 1 \times 1 = 1$$

$$6 \times 16^1 = 6 \times 16 = 96$$

$$\underline{97}_{10}$$

$$\begin{array}{r} 2 \overline{) 97} \\ 2 \overline{) 48-1} \\ 2 \overline{) 24-0} \\ 2 \overline{) 12-0} \\ 2 \overline{) 6-0} \\ 2 \overline{) 3-0} \\ 2 \overline{) 1-1} \end{array}$$

2. $(145)_8 = \underline{101}_{10}$

$$5 \times 8^0 = 5 \times 1 = 5$$

$$1 \times 8^1 = 1 \times 8 = 8$$

$$1 \times 8^2 = 1 \times 64 = 64$$

3. $(114)_{10} = \underline{1110010}_2$

$$\begin{array}{r} 2 \overline{) 114} \\ 2 \overline{) 57-0} \\ 2 \overline{) 28-1} \\ 2 \overline{) 14-0} \\ 2 \overline{) 7-0} \\ 2 \overline{) 3-1} \\ 2 \overline{) 1-1} \end{array}$$

4. $(147)_8 = \underline{67}_{16}$

$$7 \times 8^0 = 7 \times 1 = 7$$

$$1 \times 8^1 = 1 \times 8 = 8$$

$$1 \times 8^2 = 1 \times 64 = 64$$

$$\underline{103}_{10}$$

$$\begin{array}{r} 16 \overline{) 103} \\ 16 \overline{) 6-7} \end{array}$$

5. $(116)_{10} = \underline{161}_8$

$$\begin{array}{r} 8 \overline{) 116} \\ 8 \overline{) 14-4} \\ 8 \overline{) 1-6} \end{array}$$

6. $(01011001)_2 = \underline{111}_8$

$$1 \times 2^0 = 1 \times 1 = 1$$

$$0 \times 2^1 = 0 \times 2 = 0$$

$$0 \times 2^2 = 0 \times 4 = 0$$

$$1 \times 2^3 = 1 \times 8 = 8$$

$$1 \times 2^4 = 1 \times 16 = 16$$

$$0 \times 2^5 = 0 \times 32 = 0$$

$$1 \times 2^6 = 1 \times 64 = 64$$

$$0 \times 2^7 = 0 \times 128 = 0$$

$$\underline{89}_{10}$$

$$\begin{array}{r} 8 \overline{) 89} \\ 8 \overline{) 11-1} \\ \underline{1-3} \end{array}$$

7. $(01001111)_2 = \underline{415}_{16}$

$$1 \times 2^0 = 1 \times 1 = 1$$

$$1 \times 2^1 = 1 \times 2 = 2$$

$$1 \times 2^2 = 1 \times 4 = 4$$

$$1 \times 2^3 = 1 \times 8 = 8$$

$$0 \times 2^4 = 0 \times 16 = 0$$

$$0 \times 2^5 = 0 \times 32 = 0$$

$$1 \times 2^6 = 1 \times 64 = 64$$

$$0 \times 2^7 = 0 \times 128 = 0$$

$$\underline{79}_{10}$$

$$\begin{array}{r} 16 \overline{) 79} \\ 16 \overline{) 4-15} \end{array}$$

8. $(55)_{16} = \underline{85}_{10}$

$$5 \times 16^0 = 5 \times 1 = 5$$

$$5 \times 16^1 = 5 \times 16 = 80$$

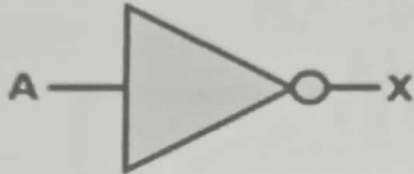
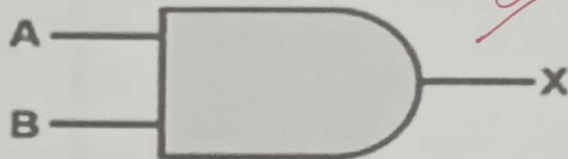
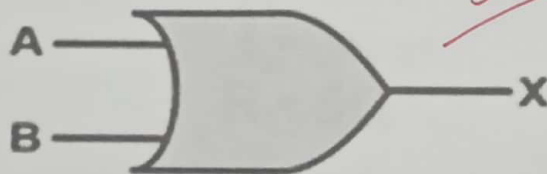
$$\underline{85}$$

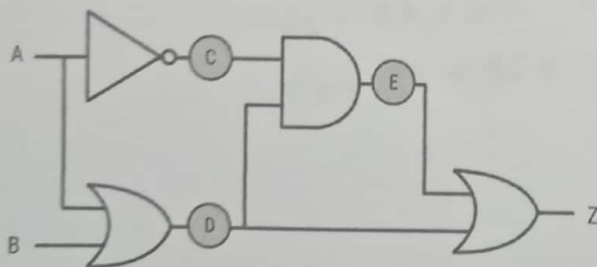
W6 – LONG EXAM

PROG5: Device Programming

Logic Gates

Identify each of these logic gates by name, and complete their respective truth tables. 5pts each gates; Total pts: 35pts

Gate	Symbol	Rule
NOT		$0 \rightarrow 1$ ✓ $1 \rightarrow 0$ ✓
AND		$00 \rightarrow 0$ ✓ $01 \rightarrow 0$ ✓ $10 \rightarrow 0$ ✓ $11 \rightarrow 1$ ✓
OR		$00 \rightarrow 0$ ✓ $01 \rightarrow 1$ ✓ $10 \rightarrow 1$ ✓ $11 \rightarrow 1$ ✓



Input A	Input B	$\sim C$	D	E	Output Z
A	B	$\sim C$	D	E	D+E
0	0	1 ✓	0 ✓	0 ✓	0 ✓
0	1	1 ✓	1 ✓	0 ✓	1 ✓
1	0	0 ✓	1 ✓	0 ✓	1 ✓
1	1	0 ✓	1 ✓	0 ✓	1 ✓

W6 – LONG EXAM

PROG5: Device Programming

Circuit

Calculate what is missing from the series circuit. Show your solution. Total pts: 15pts

$$V_1 = 30V$$

$$I_1 = 2A$$

$$R_1 = 15\Omega$$

$$V_T = 80V$$

$$I_T = 2A$$

$$R_T = 40\Omega$$

$$V_2 = 40V$$

$$I_2 = 2A$$

$$R_2 = 20\Omega$$

$$V_3 = 10V$$

$$I_3 = 2A$$

$$R_3 = 5\Omega$$

$$V_1 = 2A \times 15\Omega = 30V$$

$$V_2 = 2A \times 20\Omega = 40V$$

$$V_3 = 2A \times 5\Omega = 10V$$

$$I_T = \frac{80V}{40\Omega} = 2A$$

$$I_1 = I_T$$

$$I_2 = I_T$$

$$I_3 = I_T$$

$$R_T = ?$$

$$V_T = ?$$

69

3
9
22
13
20
2

69

W6 - LONG EXAM PROG5: Device Programming

Name: JASPER PAULEN S. ANGELES

Section: BITE - LP-3A

Date: 10-26-03

Day 3 - LABORATORY - Long Examination Number System

Instructions: Using the ASCII Alphabet, Solve and decode the problem. Show your solutions.

5pts per Solution; 10pts- Decoded Table Total Points: 50pts

ASCII Alphabet Characters

Symbol	Decimal	Binary
A	65	01000001
B	66	01000010
C	67	01000011
D	68	01000100
E	69	01000101
F	70	01000110
G	71	01000111
H	72	01001000
I	73	01001001
J	74	01001010
K	75	01001011
L	76	01001100
M	77	01001101
N	78	01001110
O	79	01001111
P	80	01010000
Q	81	01010001
R	82	01010010
S	83	01010011
T	84	01010100
U	85	01010101
V	86	01010110
W	87	01010111
X	88	01011000
Y	89	01011001
Z	90	01011010

Symbol	Decimal	Binary
a	97	01100001
b	98	01100010
c	99	01100011
d	100	01100100
e	101	01100101
f	102	01100110
g	103	01100111
h	104	01101000
i	105	01101001
j	106	01101010
k	107	01101011
l	108	01101100
m	109	01101101
n	110	01101110
o	111	01101111
p	112	01110000
q	113	01110001
r	114	01110010
s	115	01110011
t	116	01110100
u	117	01110101
v	118	01110110
w	119	01110111
x	120	01111000
y	121	01111001
z	122	01111010

Reference: ASCII Alphabet Characters
(kerryr.net)

3

1. $(61)_{16} = \underline{1100001}_2 \neq \underline{Aa}$
2. $(145)_8 = \underline{101}_{10} \neq \underline{e}$
3. $(114)_{10} = \underline{1010010}_2 = \underline{R}$
4. $(147)_8 = \underline{103}_{16} = \underline{g}$
5. $(116)_{10} = \underline{1110100}_2 = \underline{t}$
6. $(01011001)_2 = \underline{89}_8 = \underline{y}$
7. $(01001111)_2 = \underline{79}_{16} = \underline{O}$
8. $(55)_{16} = \underline{85}_{10} \neq \underline{v}$

y	O	v		a	R	e		g	R	e	a	t
6	7	8		1	3	2		4	3	2	1	5

9

W6 - LONG EXAM

PROG5: Device Programming

22

1. $(61)_{16} = \underline{1100001}_2$

$$\begin{aligned} 1 \times 16^0 &= 1 \times 1 = 1 \\ 6 \times 16^1 &= 16 \times 6 = 96 \\ \hline &97_{10} \end{aligned}$$

$$\begin{array}{r} 2 \overline{) 97} \\ \underline{48} - \\ 240 \\ \underline{120} - \\ 60 \\ \underline{30} - \\ 10 \\ \underline{10} - \\ 0 \end{array}$$

4

2. $(145)_8 = \underline{101}_{10}$

$$\begin{aligned} 5 \times 8^0 &= 1 \times 5 = 5 \\ 4 \times 8^1 &= 8 \times 4 = 32 \\ 1 \times 8^2 &= 64 \times 1 = 64 \\ \hline &101_{10} \end{aligned}$$

$$\underline{101}_{10}$$

4

3. $(114)_{10} = \underline{1010010}_2$

$$\begin{array}{r} 2 \overline{) 114} \\ \underline{57} - 0 \\ 28 - 1 \\ 14 - 0 \\ 7 - 0 \\ 3 - 1 \\ 1 - 1 \end{array}$$

$$\begin{array}{r} 1024 \\ 512 \\ 256 \\ 128 \\ 64 \\ 32 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \end{array}$$

$$\begin{array}{r} 2 \overline{) 114} \\ \underline{57} - 0 \\ 28 - 1 \\ 14 - 0 \\ 7 - 0 \\ 3 - 1 \\ 1 - 0 \end{array}$$

2

4. $(147)_8 = \underline{103}_{16}$

$$\begin{aligned} 7 \times 8^0 &= 1 \times 7 = 7 \\ 4 \times 8^1 &= 8 \times 4 = 32 \\ 1 \times 8^2 &= 64 \times 1 = 64 \\ \hline &103_{16} \end{aligned}$$

$$\underline{103}_{16}$$

67₁₆

5. $(116)_{10} = \underline{1110100}_8$

$$\begin{array}{c} 116 \\ \hline 64 \quad 32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1 \\ \hline 1 \quad 1 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$$

$$\begin{array}{r} 1 \overline{) 116} \\ \underline{110} - \\ 60 \\ \underline{48} - \\ 12 \\ \underline{12} - \\ 0 \end{array}$$

2

6. $(01011001)_2 = \underline{89}_{10}$

$$\begin{aligned} 1 \times 2^0 &= 1 \times 1 = 1 \\ 0 \times 2^1 &= 2 \times 0 = 0 \\ 0 \times 2^2 &= 4 \times 0 = 0 \\ 1 \times 2^3 &= 8 \times 1 = 8 \\ 1 \times 2^4 &= 16 \times 1 = 16 \\ 0 \times 2^5 &= 32 \times 0 = 0 \\ 1 \times 2^6 &= 64 \times 1 = 64 \\ 0 \times 2^7 &= 128 \times 0 = 0 \end{aligned}$$

$$131_8$$

$$1 + 8 + 16 + 64 = 89_{10}$$

2

7. $(01001111)_2 = \underline{79}_{16}$

$$\begin{aligned} 1 \times 2^0 &= 1 \times 1 = 1 \\ 1 \times 2^1 &= 2 \times 1 = 2 \\ 1 \times 2^2 &= 4 \times 1 = 4 \\ 1 \times 2^3 &= 8 \times 1 = 8 \\ 0 \times 2^4 &= 16 \times 0 = 0 \\ 0 \times 2^5 &= 32 \times 0 = 0 \\ 1 \times 2^6 &= 64 \times 1 = 64 \\ 0 \times 2^7 &= 128 \times 0 = 0 \end{aligned}$$

$$1 + 2 + 4 + 8 + 64 = 79_{10}$$

$$\begin{array}{r} 16 \overline{) 79} \\ \underline{48} - \\ 31 \end{array}$$

15 = F

4F₁₆

8. $(55)_{16} = \underline{85}_{10}$

$$\begin{aligned} 5 \times 16^0 &= 1 \times 5 = 5 \\ 5 \times 16^1 &= 16 \times 5 = 80 \\ \hline &85_{10} \end{aligned}$$

$$\underline{85}_{10}$$



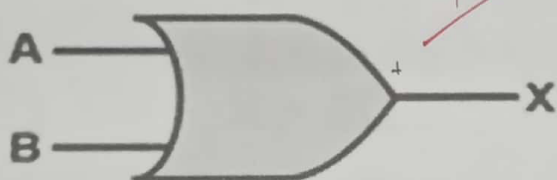
4

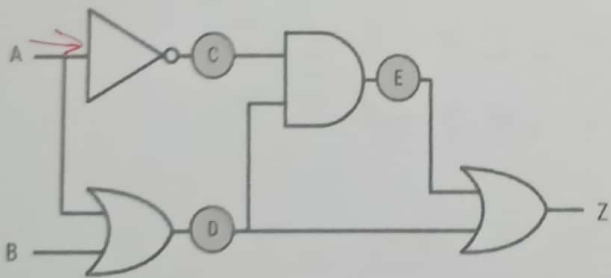
W6 – LONG EXAM

PROG5: Device Programming

Logic Gates

Identify each of these logic gates by name, and complete their respective truth tables. 5pts each gate; Total pts: 35pts

Gate	Symbol	Rule
NOT OR		$0 \rightarrow 1$ ✓ $1 \rightarrow 0$ ✓
AND		$00 \rightarrow 0$ ✓ $01 \rightarrow 0$ ✓ $10 \rightarrow 0$ ✓ $11 \rightarrow 1$ ✓
OR NOT		$00 \rightarrow 0$ ✓ $01 \rightarrow 1$ ✓ $10 \rightarrow 1$ ✓ $11 \rightarrow 1$ ✓



20

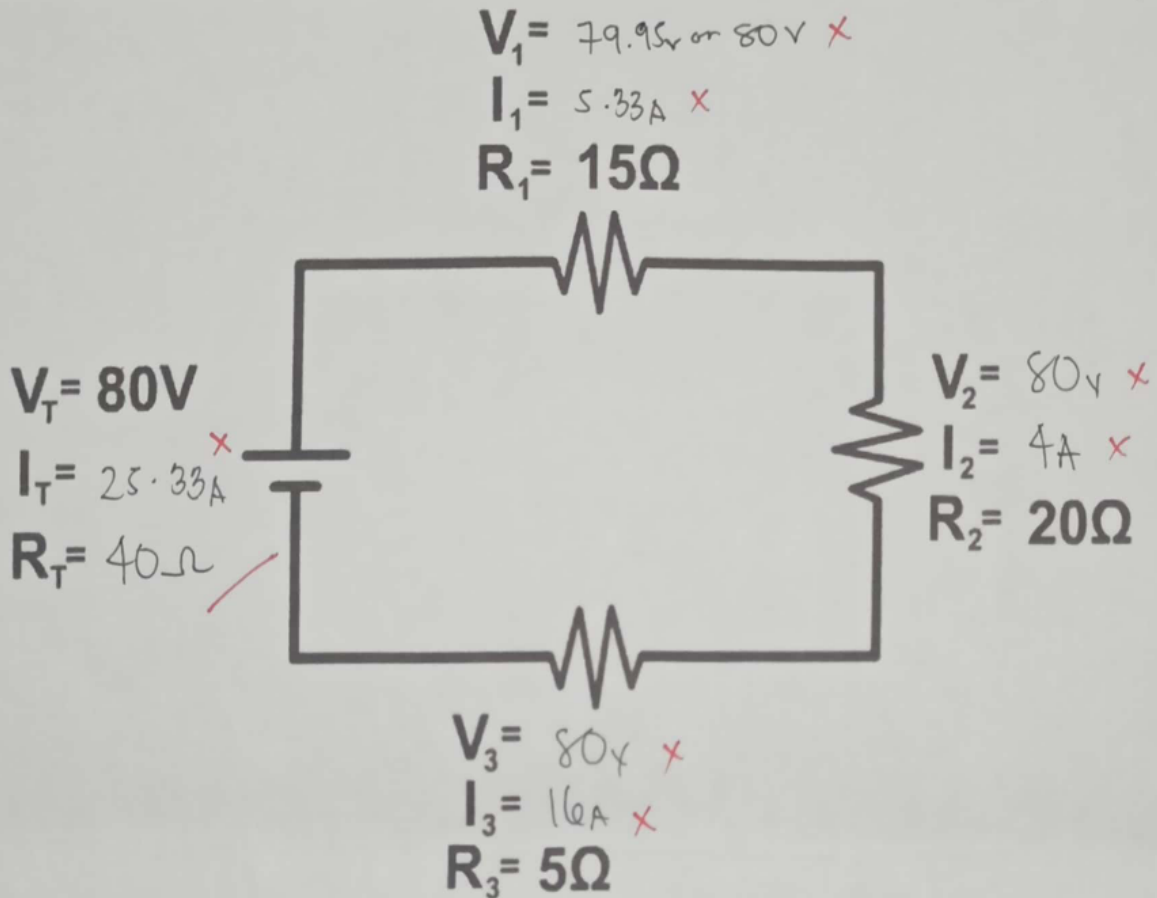
Input A	Input B	C	D	E	Output Z
A	B	$A \rightarrow \bar{A}$ ✓	$A+B$ ✓	$C \times D$ ✓	$E+D$ ✓
0	0	1 ✓	0 ✓	0 ✓	0 ✓
0	1	1 ✓	1 ✓	1 ✓	1 ✓
1	0	0 ✓	1 ✓	0 ✓	1 ✓
1	1	0 ✓	1 ✓	0 ✓	1 ✓

W6 – LONG EXAM PROG5: Device Programming

Circuit

2

Calculate what is missing from the series circuit. Show your solution. Total pts: 15pts



$$R_T = 15\Omega + 20\Omega + 5\Omega = 40\Omega \quad \checkmark$$

$$I_T = I_1 = I_2 = I_3$$

$$I_T = 5.33A + 4A + 16A = 25.33A$$

$$I_1 = \frac{80V}{15\Omega}$$

$$I_2 = \frac{80V}{20\Omega} = 4A$$

$$I_3 = \frac{80}{5\Omega}$$

$$V_1 = 5.33A \times 15\Omega$$

$$V_2 = 4A \times 20\Omega$$

$$I_3 = 16A$$

$$V_2 = 80V$$

$$V_3 = 16A \times 5\Omega$$

$$V_1 = 79.95V$$

$$V_3 = 80V$$