

EXPERIMENT NO. - 13

Aim of the Experiment:

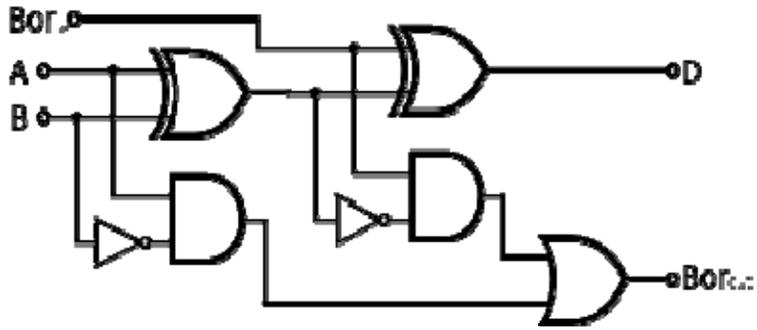
Design, assemble and testing of Full subtractor **Theory:**

The full-subtractor is a [combinational circuit](#) which is used to perform subtraction of three [bits](#). It has three inputs, X ([minuend](#)) and Y([subtrahend](#)) and Z ([subtrahend](#)) and two outputs D (difference) and B (borrow).

X	Y	Z	D	B
0	0	0	0	0
0	0	1	1	1
0	1	0	1	1
0	1	1	0	1
1	0	0	1	0
1	0	1	0	0
1	1	0	0	0
1	1	1	1	1

$$D = X \oplus Y \oplus Z$$

$$B = \bar{X} \cdot (Y \oplus Z) + Y \cdot Z$$

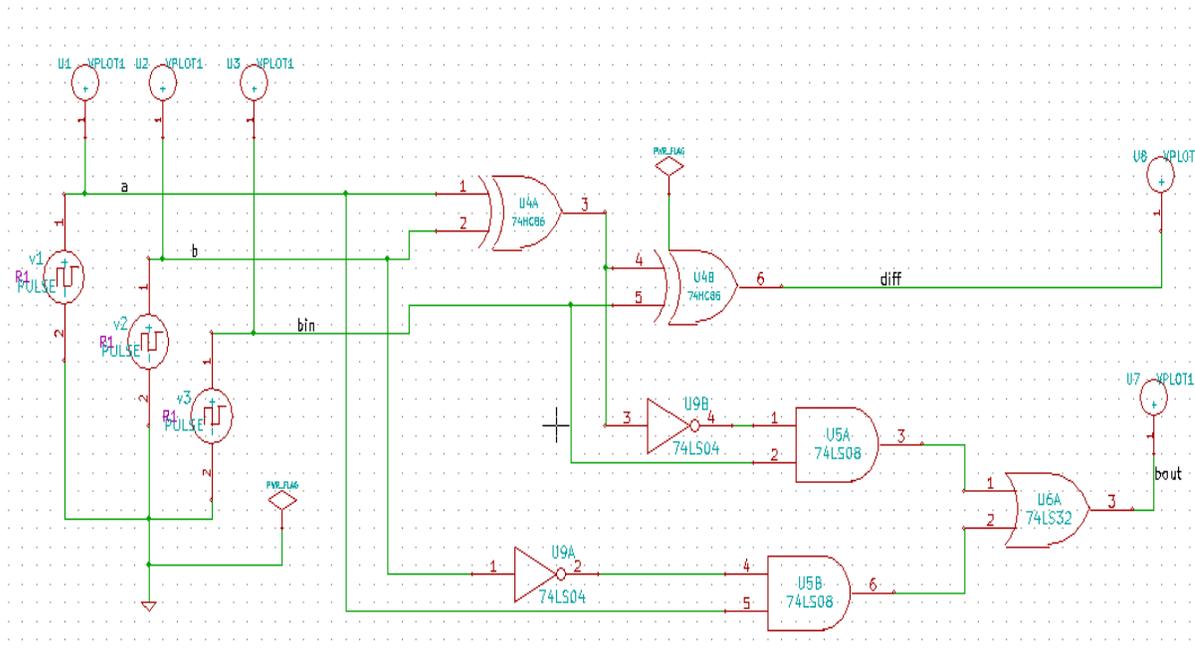


Circuit Diagram

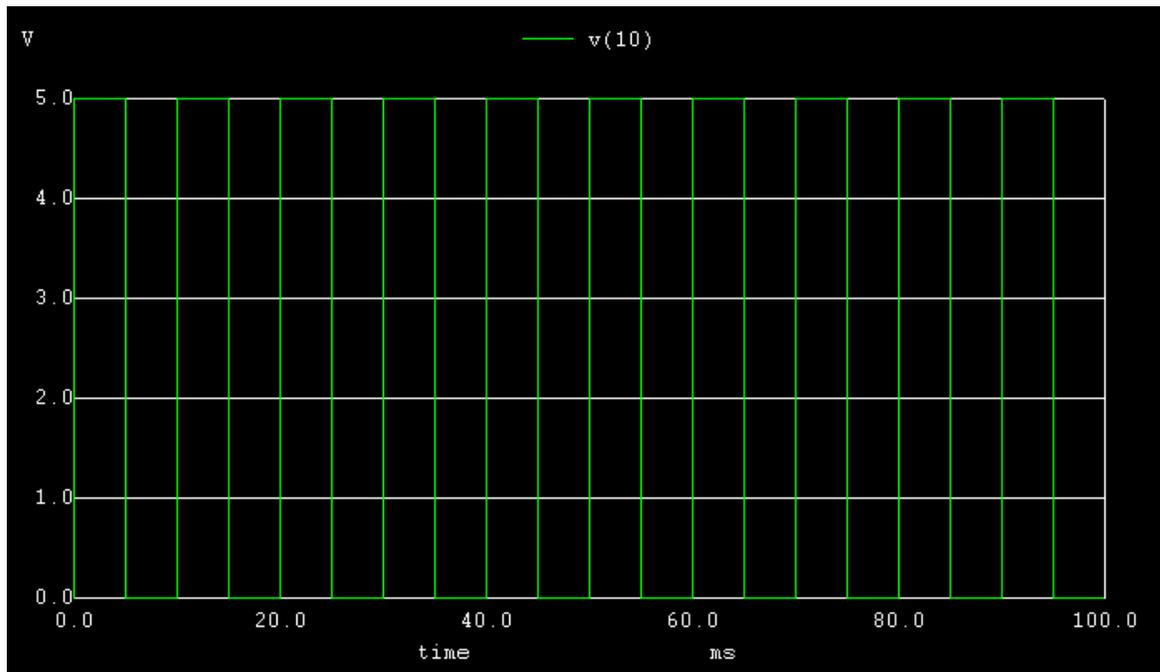
A	B	Barrow In from	Barrow out had to	Diff
0	1	1	0	0
0	0	1	1	1
0	1	0	0	1
0	0	0	0	0
1	1	1	1	1
1	0	1	1	0
1	1	0	0	0
1	0	0	1	1

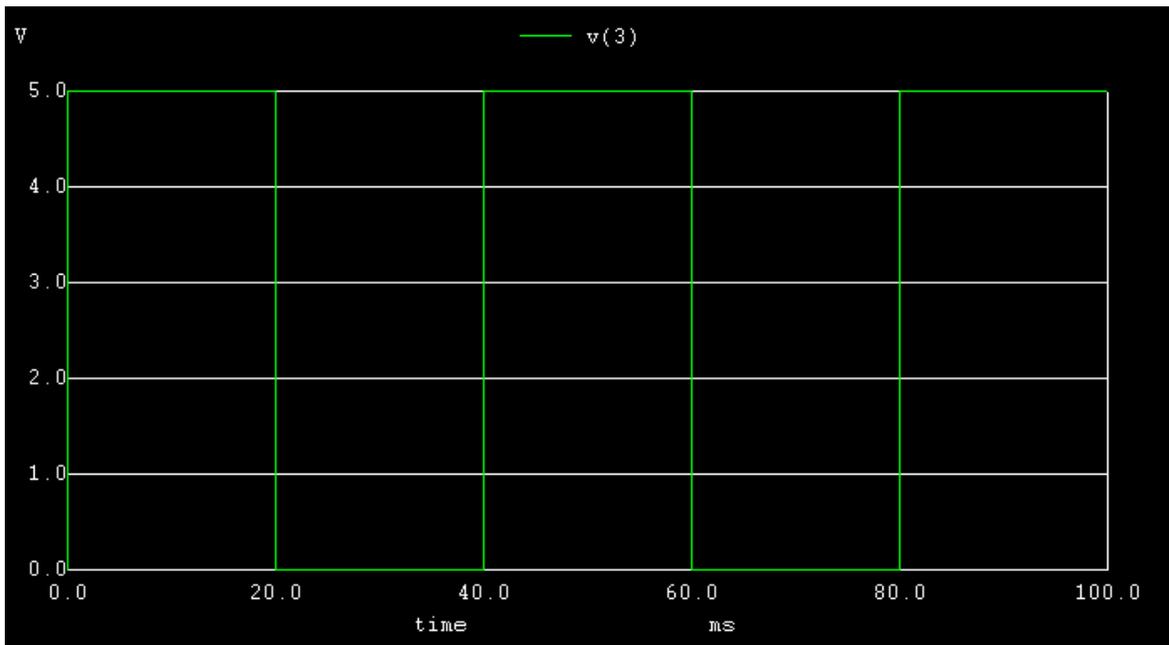
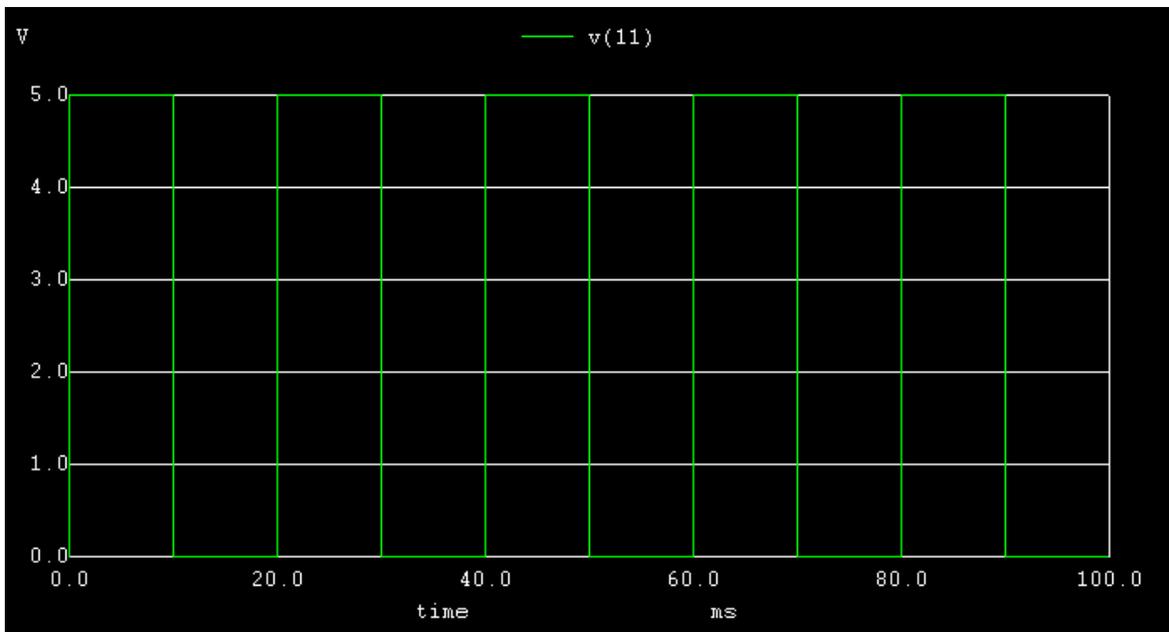
Truth Table

Schematic Circuit:

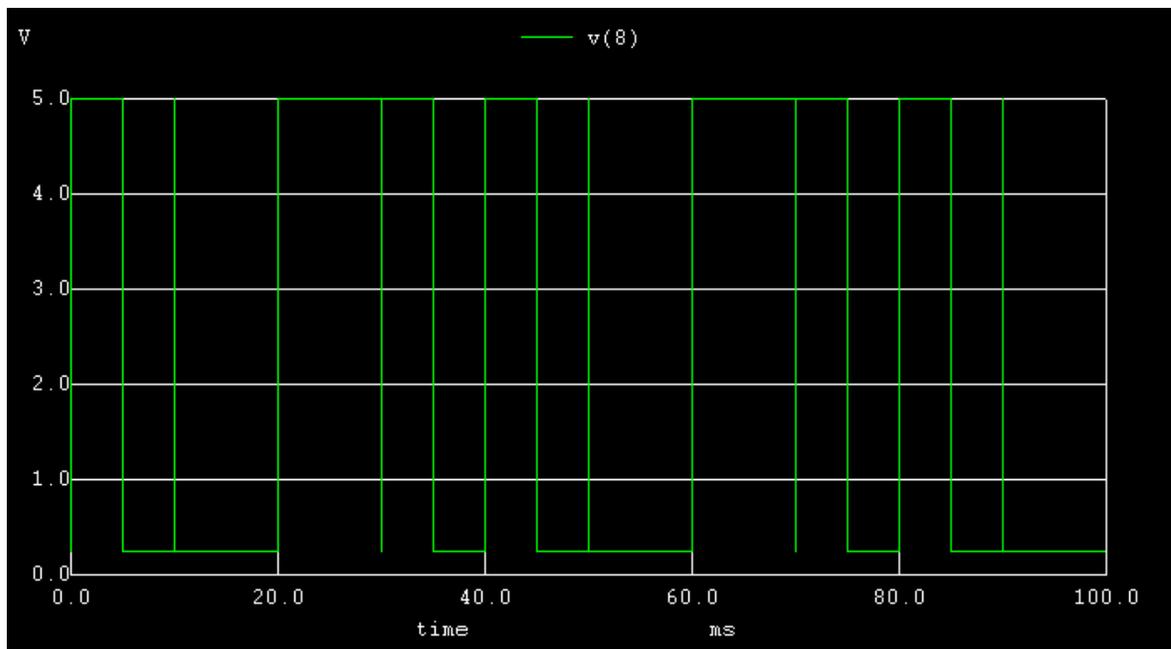
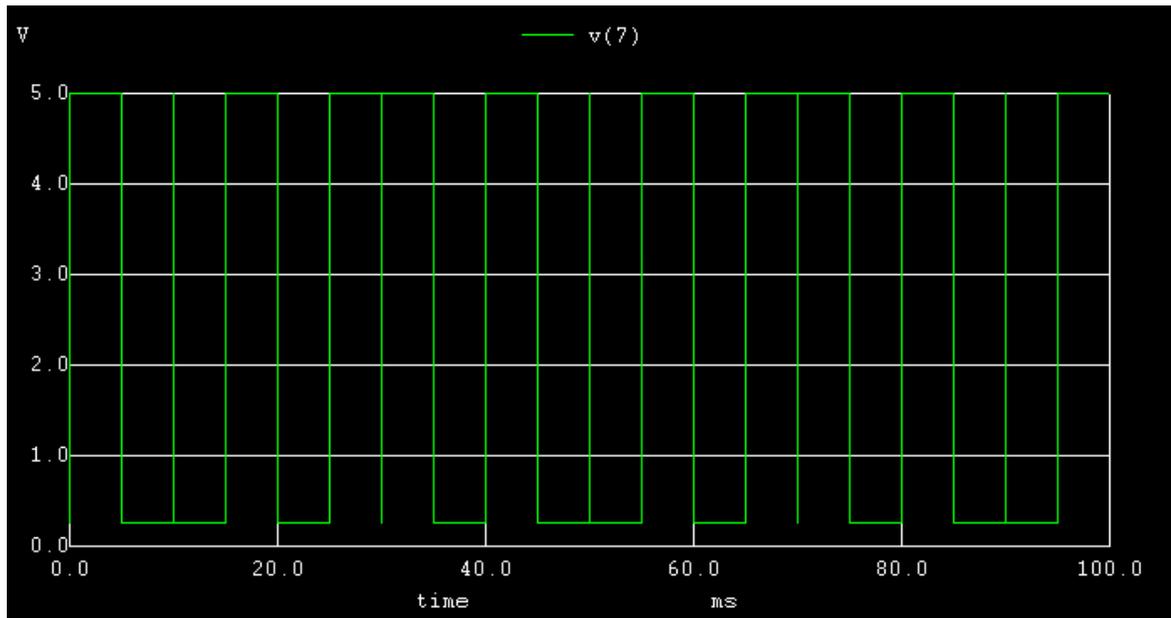


Input Waveform:





Output Waveform:



Conclusion:

Date:

Signature of the Student

NAME:

ROLL NO.:

GROUP ID:

SUB GROUP NO.:

Experiment Mark: / 20

Instructor's Signature