Brac University

Lab Assignment 06

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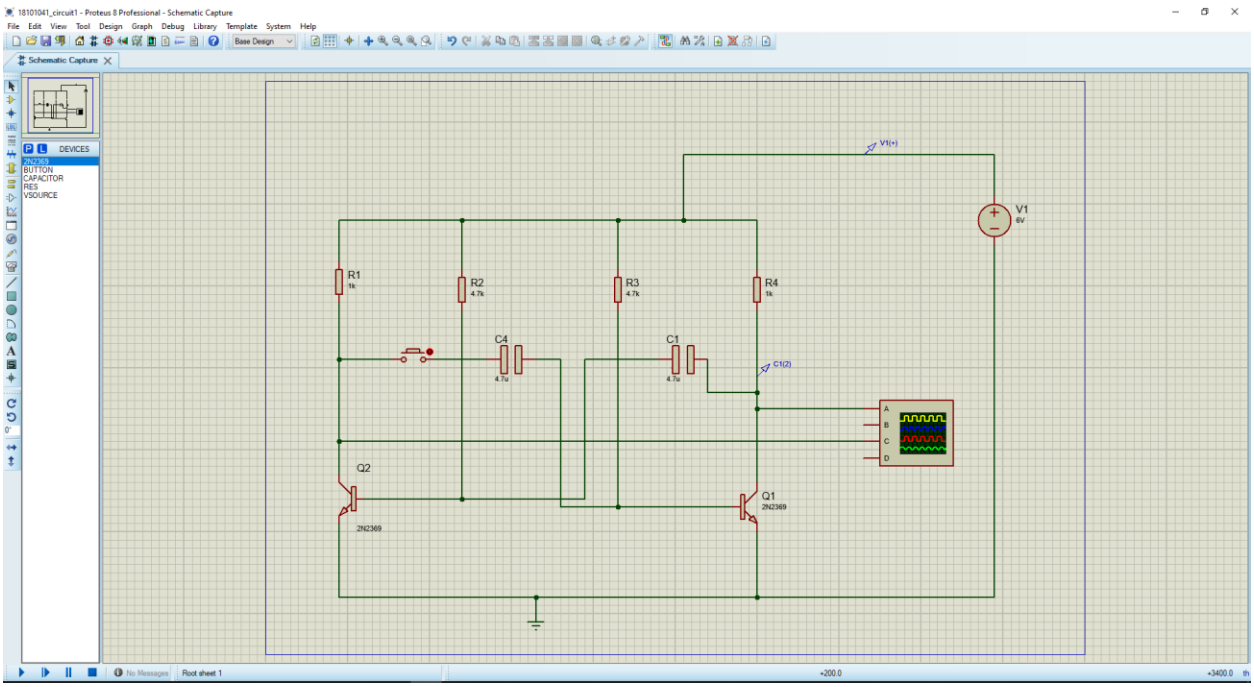
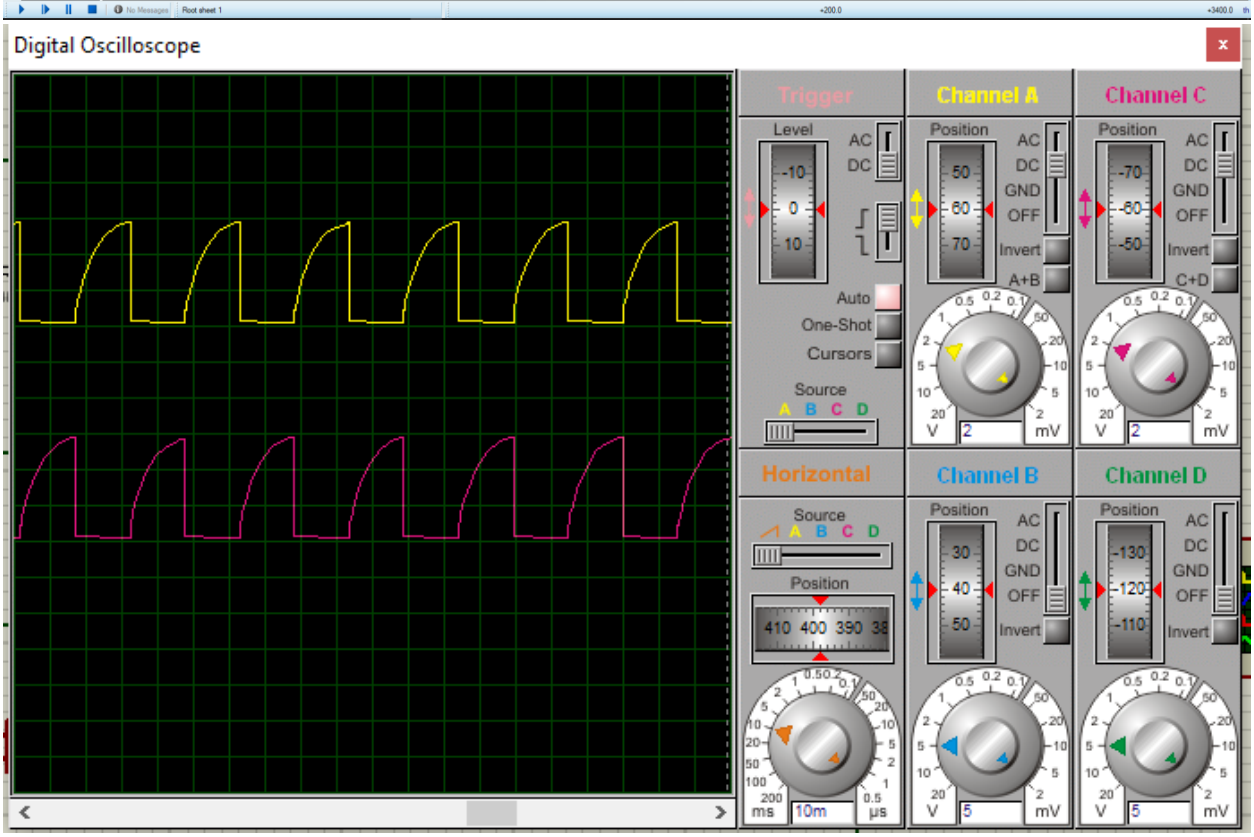
Section	01
Course Code	CSE350
Course Title	Digital Electronics and Pulse Techniques


18101041_circuit1 - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Schematic Capture
DEVICES
2N2369
BUTTON
CAPACITOR
RES
VSOURCE
R1
1k
R2
4.7k
R3
4.7k
R4
1k
C4
4.7u
C1
4.7u
C1(2)
Q2
2N2369
Q1
2N2369
V1
6V
V1(+)
A
B
C
D
No Messages
Root sheet 1
+200.0
+3400.0


Digital Oscilloscope
Trigger
Level
-10
0
10
AC
DC
Auto
One-Shot
Cursors
Source
A B C D
Channel A
Position
50
60
70
AC
DC
GND
OFF
Invert
A+B
V
2
mV
Channel C
Position
-70
-60
-50
C+D
Horizontal
Source
A B C D
Position
410 400 390 38
200
ms
10m
0.5
µs
Channel B
Position
30
40
50
5
Channel D
Position
-130
-120
-110

Date .....

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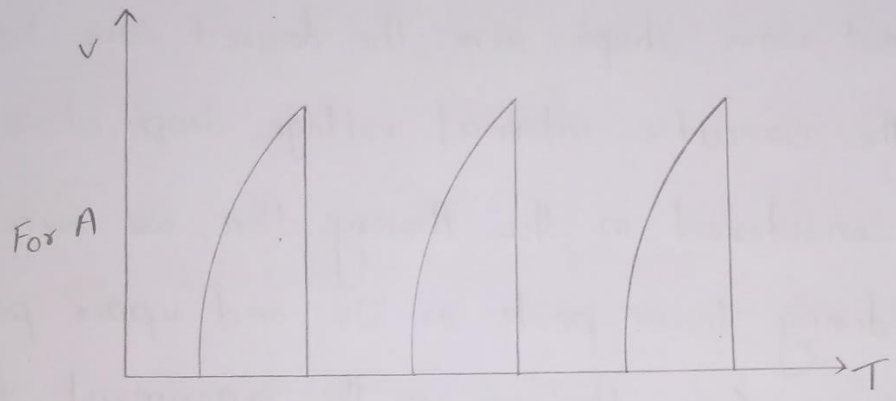
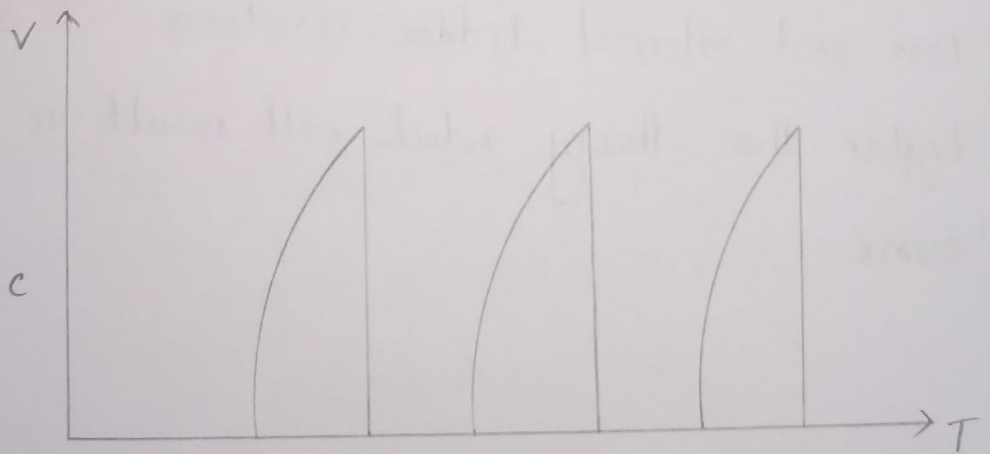
Answer - 01



For A



For C

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Answer - 02

There are some deviation in the experimental output wave shape from the desired wave because of the circuit's internal voltage drop which was not considered in the theory. Here, we were considering lower peak as 0v and upper peak as Vcc or 6v. However, in the experiment, from the digital oscilloscope we got 0.25 v as lower peak and 5.8 v as upper peak. Moreover, due to system loss and internal hidden resistance T becomes higher than theory which will result in flatter curve.

Date

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Answer - 03

The time period of the experimental wave is similar to the calculated wave.

Here,

For theoretical or calculated wave

$$t_1 = 0.69 \times C_1 \times R_3$$

$$= 0.69 \times 4.7 \times 10^{-6} \times 4.7 \times 10^{3}$$

$$= 0.0152421\ s$$

$$= 15.2421\ ms.$$

$$t_2 = 0.69 \times C_2 \times R_2$$

$$= 0.69 \times 4.7 \times 10^{-6} \times 4.7 \times 10^{3}$$

$$= 0.0152421\ s$$

$$= 15.2421\ ms.$$

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Time period, $T = t_1 + t_2$

$= (15.2421 + 15.2421)$ ms

$= 30.4842$ ms.

From Proteus,

we got Time period, $T_p = 30.52$ ms.

So, we can say that the time period of experimental wave and calculated wave is almost same.

Answer - 04

It can be possible to use the above multivibrator to create variable frequency square wave if we use variable resistor or variable capacitor. We know that frequency of a square wave is dependent on the time period. In the multivibrator t_1 and t_2 both depends on the resistor and capacitor on the circuit. In this way, we can create frequency square wave.

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Answer - 05

We can change the duty cycle of the circuit by changing the valie of the resistances. or capacitors.