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periment No. : Performed Date : / /20

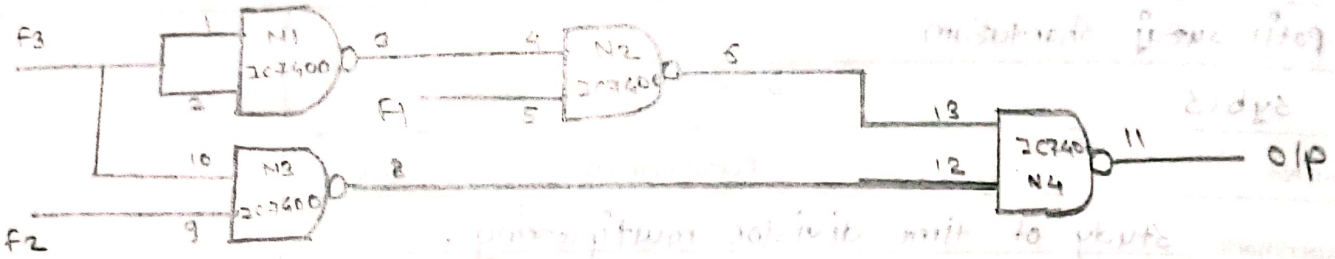
e of Experiment : study of time division multiplexing.

REMARKS

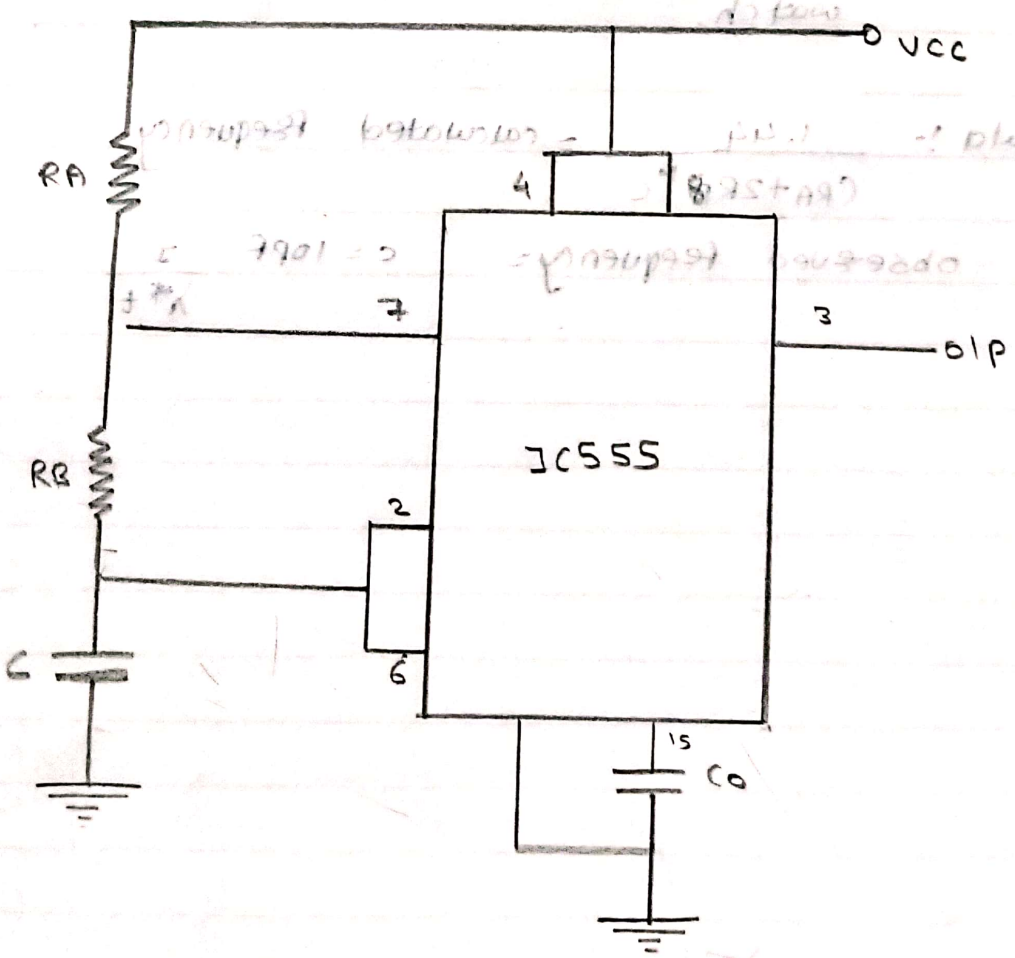
- Aim :- to study the time division multiplexing.
- Apparatus : CRO, circuit board, connecting wires, stop watch.
- Formula :- $\frac{1.44}{(R_A + 2R_B) * C}$ = calculated frequency

observed frequency = $C = 10pF \quad \frac{1}{\lambda * t}$

Circuit diagram time division multiplexing :-



Circuit for Generating Frequency :-



- Procedure :-

1] connect the circuit as shown in fig.
2] Before switching ON calculte f_1, f_2, f_3 by using formula.
3] now connect CRO between pin 3 ground and measure frequency f_1.
4] connect CRO between 11 of 7400 and GND observe that frequency f_1 and f_2 alternatively after particular interval and calculate frequency f_3 from that time measure frequency f_3 by using stopwatch.
5] theoretical and practical value of f_1, f_2, f_3 and write suitable conclusion.

- Truth table :-

control frequency f_3	i/p frequency	o/p frequency.
High level 1	f_1 and f_2	f_2
low level 0	f_1 and f_2	f_1.

- theory :-

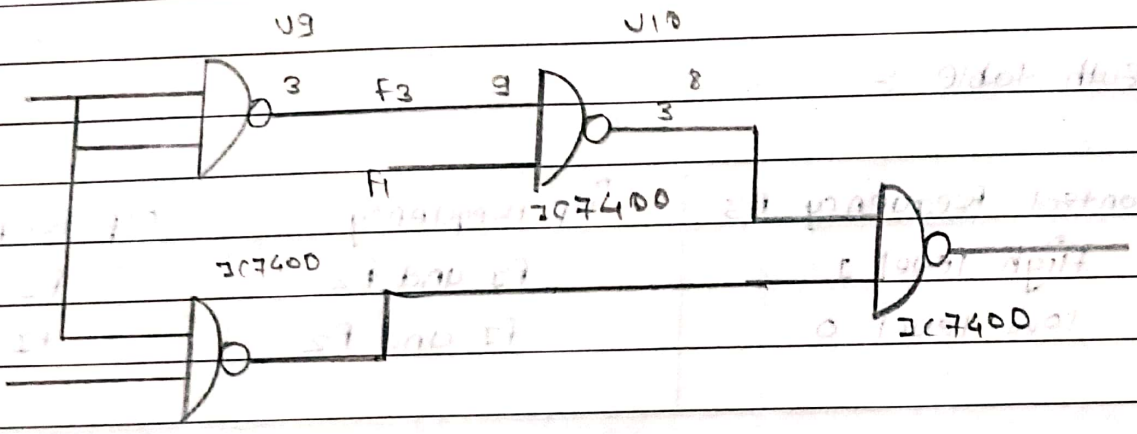
The time division multiplexing means selection of different frequency after particular interval of time. In this circuit there are three frequency f_1, f_2, f_3 is also called control frequency and with the help of f_3 selection of f_1 & f_2 is carried out.

this concept can be explained as follows :-

* Truth table of NAND Gate :-

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

* multiplexing circuit :-



* observed frequency :-

Frequency	TON	TOFF	λ = TON+TOFF	(t) time/div	T = λ*t	F = 1/T
f1	2.2	2	4.2	0.5 µs	2.1×10^{-3}	0.476 KHz
F2	2.4	2.2	4.6	0.2 µs	0.92×10^{-3}	0.086 KHz
F3	-	-	-	-	4.2	0.00283 KHz

- calculations :- for f1,

$T_{ON} = 2.2$, $T_{OFF} = 2$, $0.5\,\mu s = t$

$T = \lambda * t$

$= 4.2 \times 0.5 \times 10^{-3}$

$= 2.1 \times 10^{-3}$

$f_1 = \frac{1}{2.1 \times 10^{-3}} = 0.476$ KHz.

for f2,

$T_{ON} = 2.4$, $T_{OFF} = 2.2$, $0.2\,\mu s = t$

$\lambda = 2.4 + 2.2 = 4.6$

$T = \lambda * t$

$= 4.6 \times 0.2 \times 10^{-3}$

$= 0.92 \times 10^{-3}$

$f_2 = \frac{1}{0.92 \times 10^{-3}} = 1.086$ KHz.

for f3,

$T = 4.2$

$f_3 = \frac{1}{4.2} = 0.2380$ Hz

$= 0.00283$ KHz.

* Result :-

	calculated frequency	observed frequency.
f1	0.476 KHz	0.476 KHz
f2	1.086 KHz	1.086 KHz
f3	0.00283 KHz	0.00283 KHz.

* conclusion :-

1. we have studied TDM (time division multiplexing).
2. In TDM each signal can occupy entire BW and channel it is alloted a small time slot. Hence multiple signals are transmitted over channel turn by turn. i.e. signal F1, F2, F3.
3. where f1 and f2 are signal frequency and f3 is control frequency.
4. f1, f2 and f3 is generated by using IC755 in a stable mode.
5. Frequency is decided by value of RA, RB & C

$$f = \frac{1.44}{(RA+2RB)*C}$$

6. Hence by changing value of RA & RB & C frequency can be changed.
7. when f3 = 0, f1 will pass.
   f1 = 1, f2 will pass.

Roll No.

Expt. No.

Title of the Graph : TDM

Scale

On x axis, 1 cm =

On y axis, 1 cm =