2 STAGE COCKROFT WALTON CIRCUIT

(WITH RL LOAD)

SUBMITTED BY:

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(2023EEM1039)

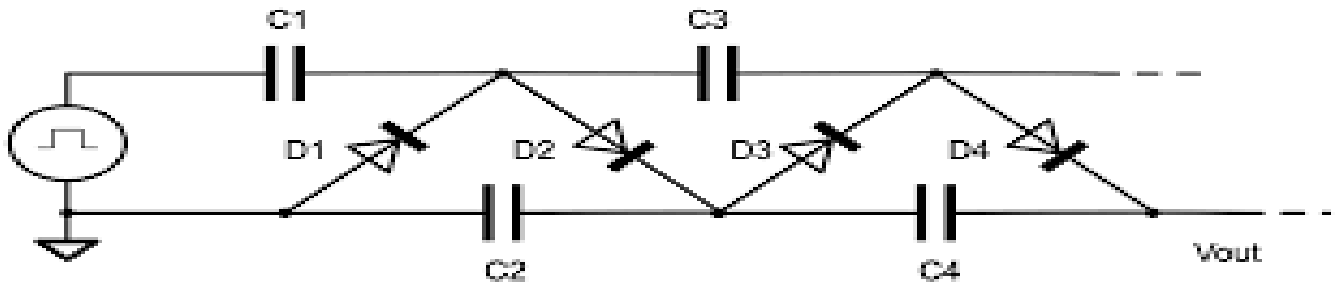
POWER ENGINEERING

SUBMITTED TO:-

PROF. C.C REDDY

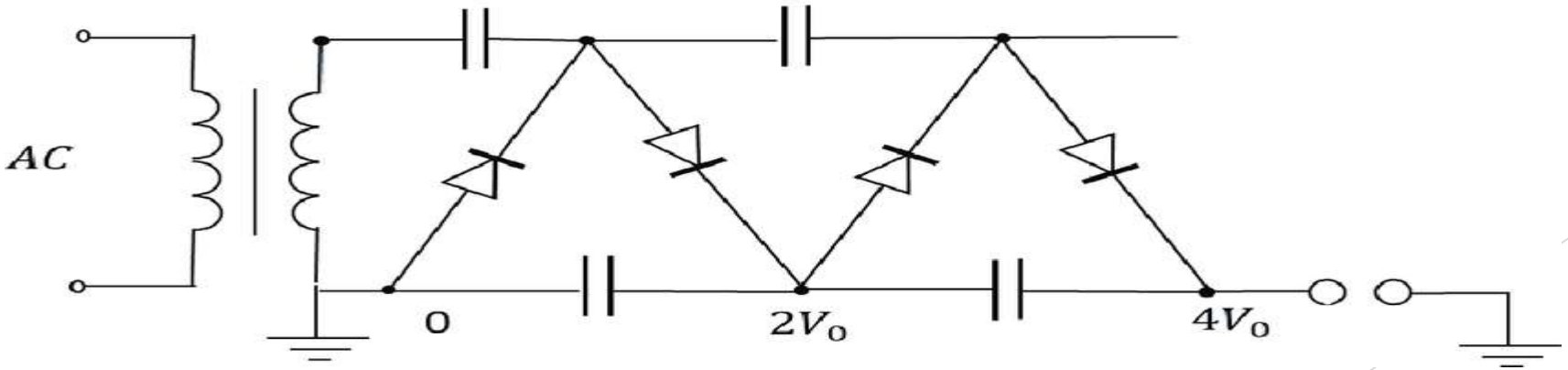
(HOD, EED)

TWO STAGE COCKROFT :



WORKING DIAGRAM:-

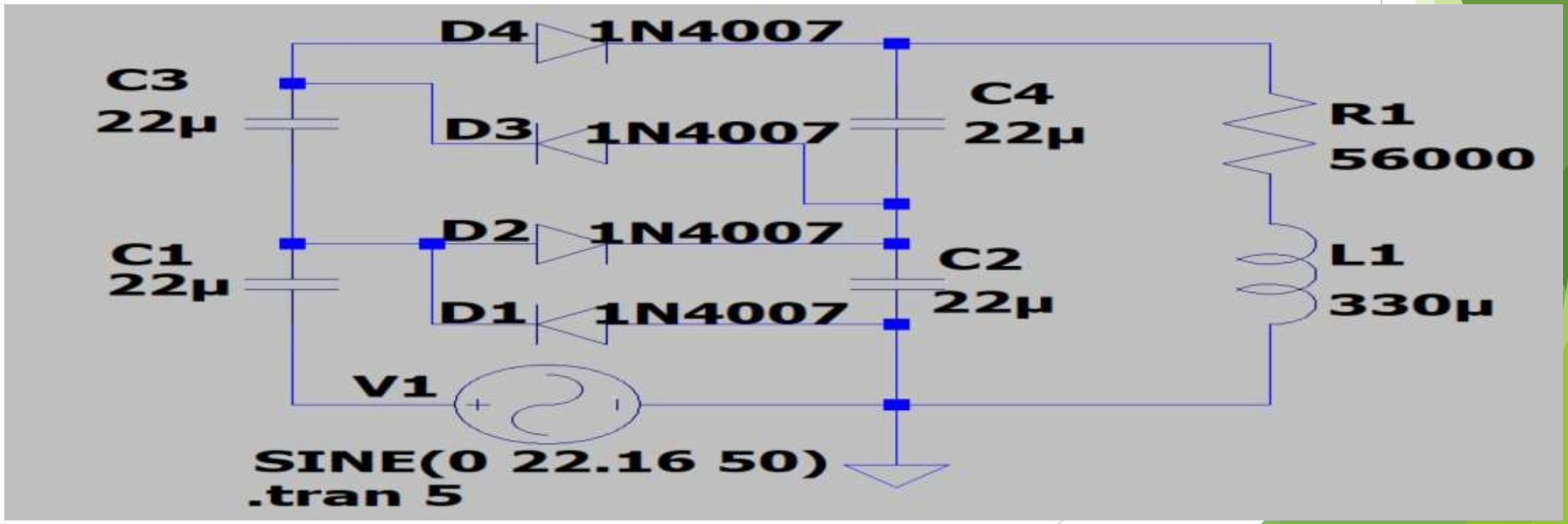
$V = V_0 \sin(wt)$ $V_0 + V_0 \sin(wt)$ $V_0 + 3V_0 \sin(wt)$



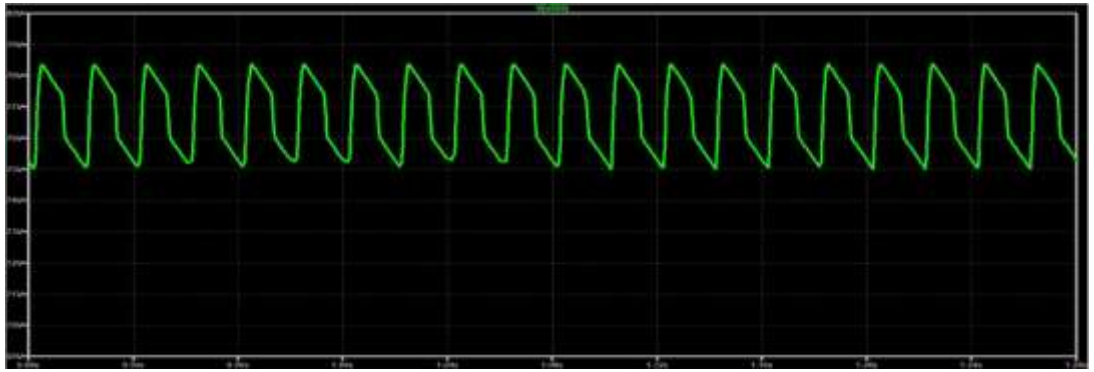
RATING OF ELEMENTS USED IN CIRCUIT:-

1) CAPACITOR 22 uF,63 V
2) DIODE: IN4007
3) RESISTOR: 56kΩ
4)INDUCTOR :330uH
5) TRANSFORMER: 15-0-15 V

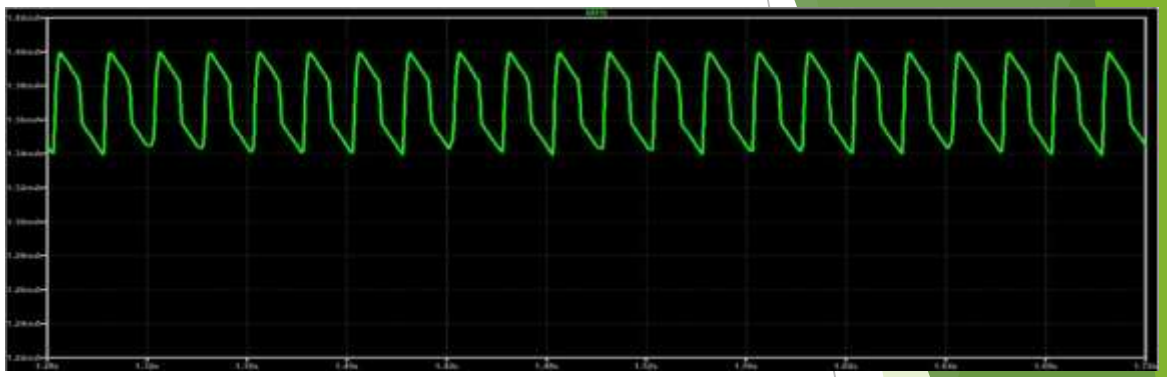
- SIMULATION DIAGRAM



SIMULATION RESULTS:-

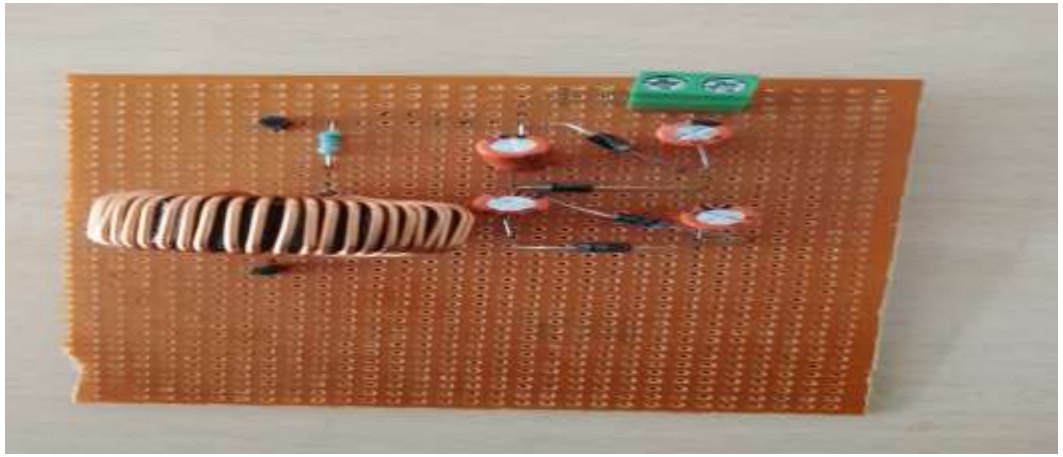


OUTPUT VOLTAGE WAVEFORM

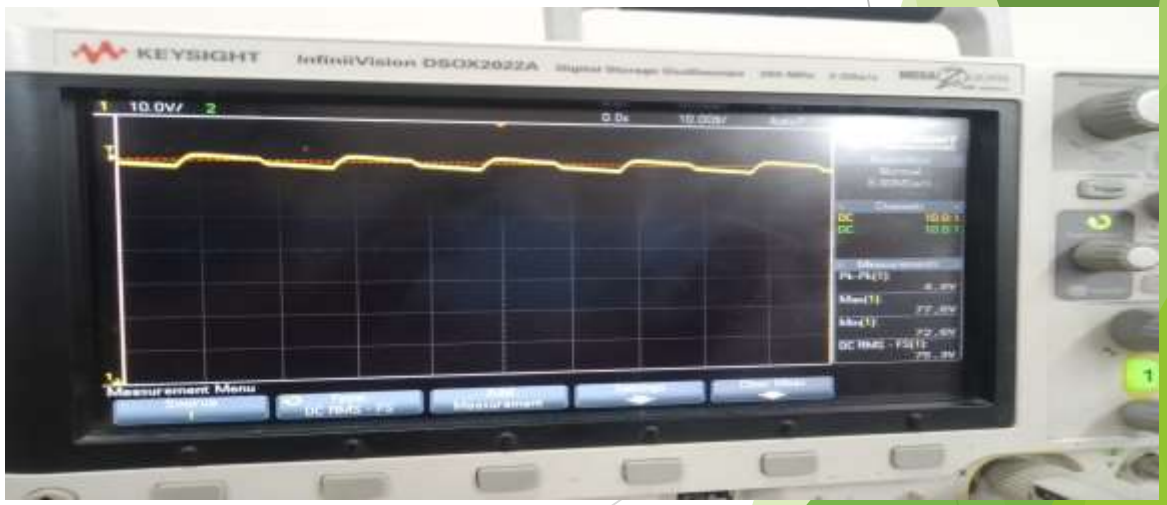


OUTPUT CURRENT WAVEFORM

HARDWARE IMPLENTATION:-



HARDWARE MODEL



OUTPUT VOLTAGE (HARDWARE)

CALCULATION

- INPUT VOLTAGE= 15.67 VOLT
- Impedance=56000.1869 ohm
- RIPPLE=4.8
- CURRENT = 1.344 mA
- CURRENT= RIPPLE * 2 * f *C = 0.01056 AMP
- Reduction in Voltage = (I/fC)*(2n^3/3 + n^2 /2 – n/6) =8.71
- Output voltage =2nVm - ΔVm = 79.53
- Ripple factor = ∂V/ Vmean= 0.060