Title of the experiment:

CLASS B PUSH PULL AMPLIFIER USING ESIM.

Theory:

Class B amplifier is one of the power amplifier used for better amplification of the input wave, it gives a larger efficiency as compared to class A power amplifier. Class B amplifier with a single transistor can conduct only in one half cycle or 180⁰ of the input waveform cycle. Two transistor of similar or complementary type can be used such that one of the transistor conducts in the positive half cycle & the other transistor conducts in the negative half cycle so the output produced is traced in both cycles , such a circuit is known as class B push pull amplifier or Quasi complementary push-pull transformer less power amplifier. Hence an output with low distortion is produced which can be witnessed in the output waveforms.

NOTE: In our project we are using transformer less push pull amplifier because the transformer coupled push pull amplifiers make it bulky & it needs two out of phase signals which necessitates an input transformer and thus makes the circuit quite complicated.

Schematic diagram:

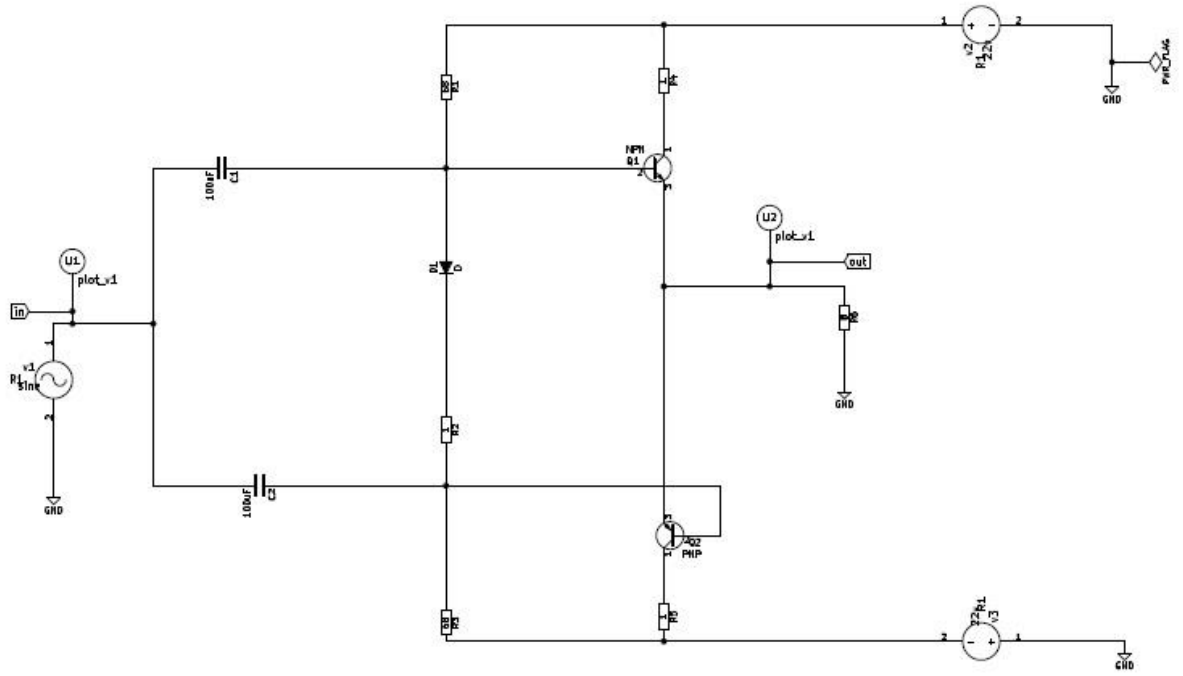

Figure 1: circuit diagram of class B push pull amplifier

Simulation Results:

NGSPICE PLOT I:

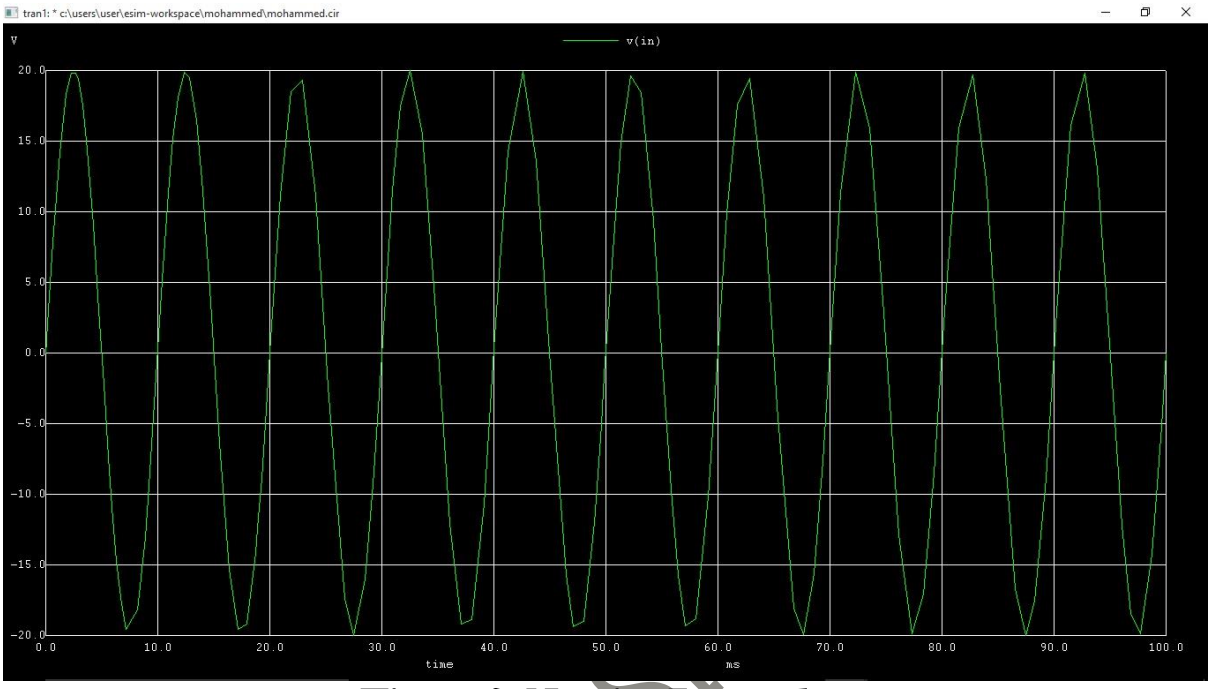

Figure 2: Ngspice Input plot

NGSPICE PLOT II:

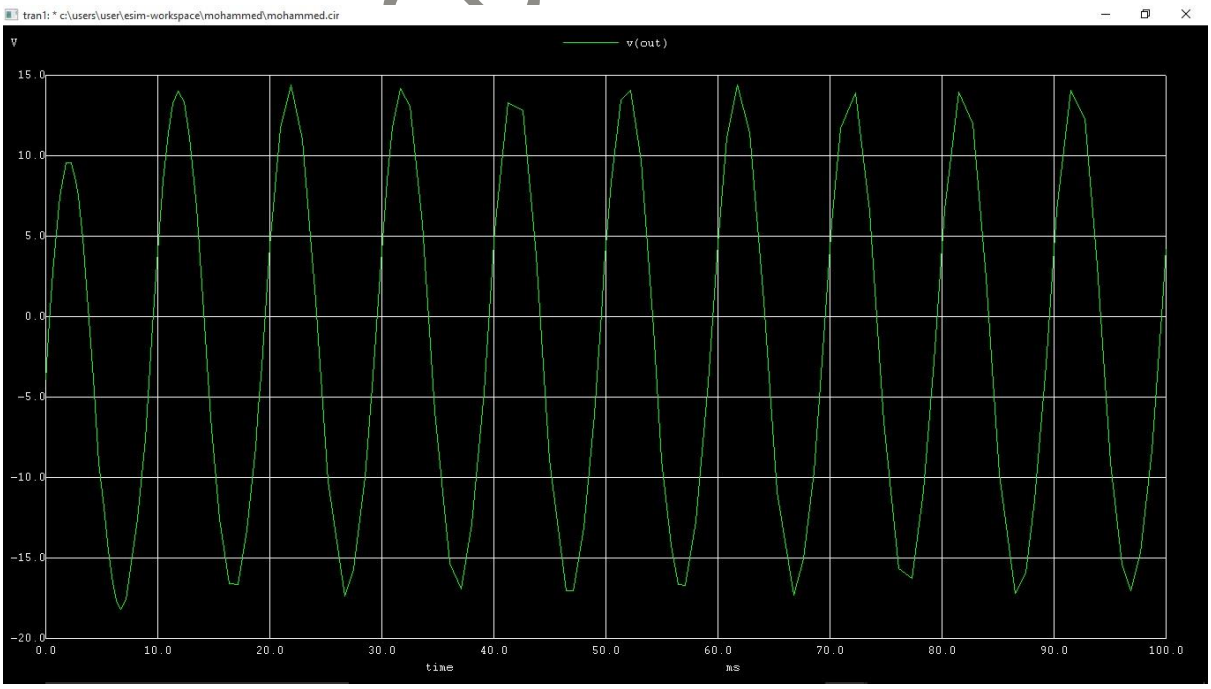

Figure 3: Ngspice output plot

PYTHON PLOTS:

Python plot I:

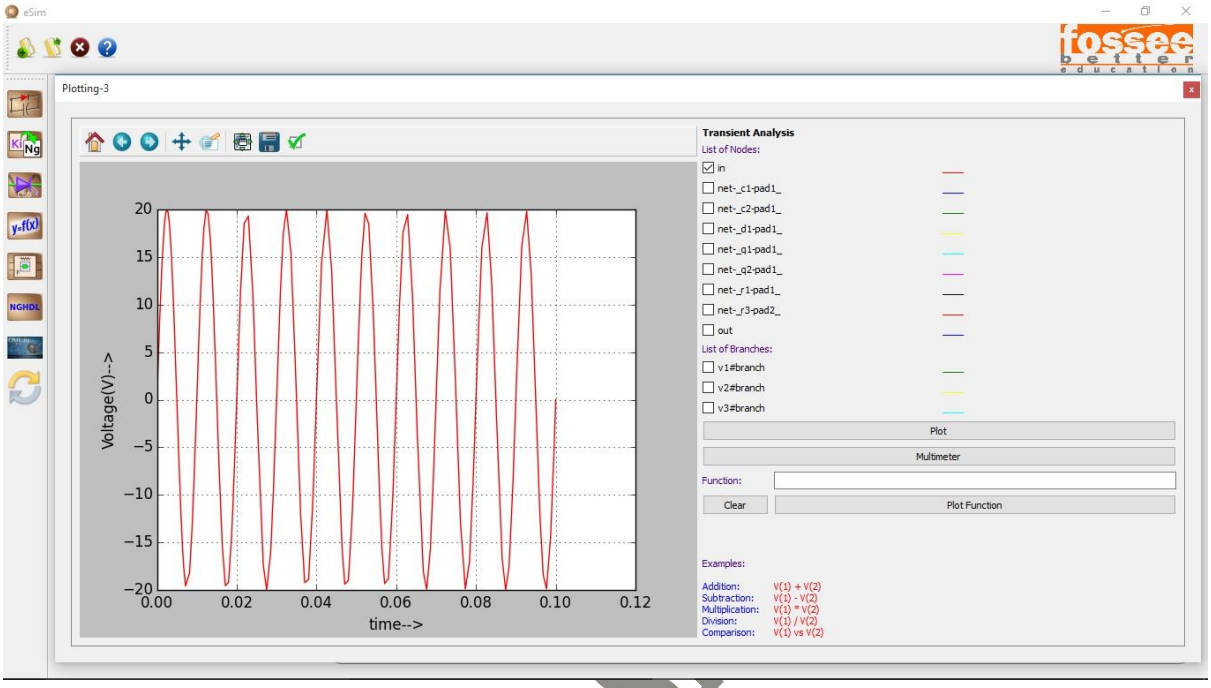

Figure 4: python input plot

Python plot II:

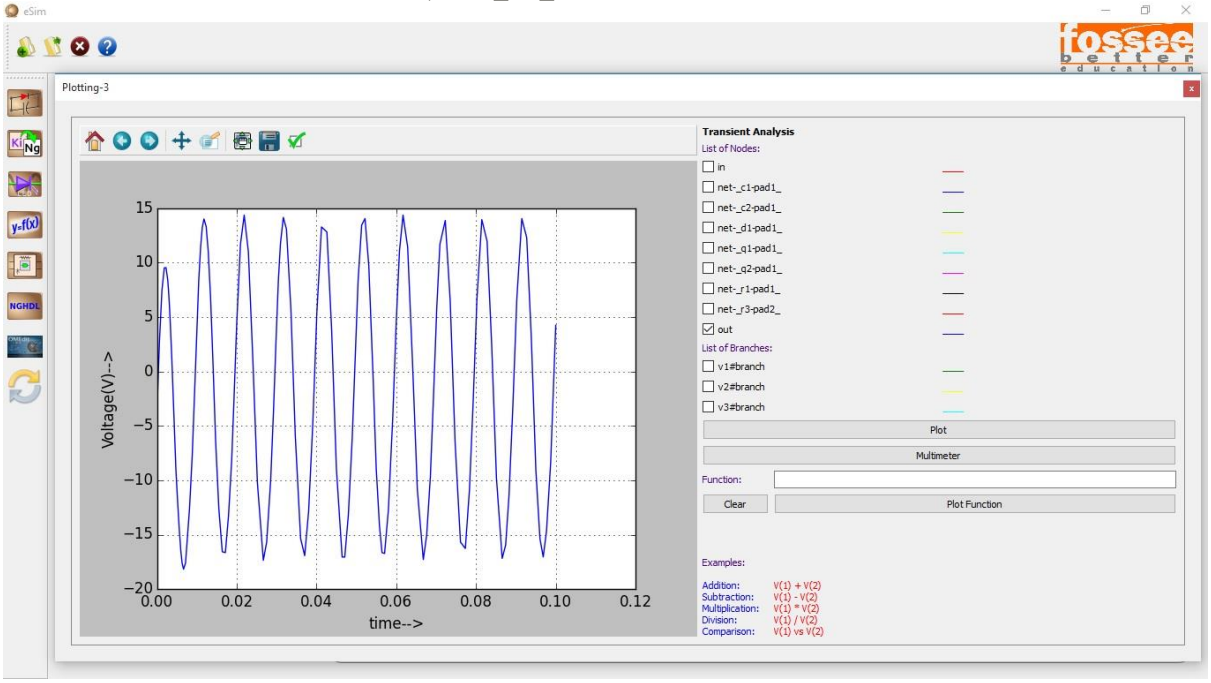

Figure 5: Python output plot

Python plot III:

Figure 6: python plot for input & output

CONCLUSION:

Hence we have studied the operation of a class B push pull amplifier using esim circuit simulation and we get the appropriate input & output waveforms.

References:

https://www.allsyllabus.com/aj/note/ECE/Analog_Electronic_Circuits/Unit7/Quasi%20complementary%20push-pull%20transformer%20less%20power%20amplifier.php#.Wm3AaKiWbIU

BOOK: ELECTRONIC DEVICES & CIRCUIT THEORY

ROBERT L BOYLESTAD

Unit: Power amplifier

ESIM CIRCUIT SIMULATION