Experiment-5

Title:- Set up and study the working of complimentary symmetry class B push-pull power amplifier and calculate efficiency

objective:- Study the working of complimentary symmetry class B push pull amplifier and calculate efficiency

Theory:- Complimentary symmetry class B Amplifier uses a complementary or matching pairs of power transistors. The class B amplifier circuit uses complimentary transistors for each half of the waveform. In a pure class B amplifier, the o/p transistors are not "pre-biased" to an "ON" state of operation. The output transistors for each half of the waveform (+ve and -ve) will each have 0.7 V area in which they will not be conducting resulting in both transistors being 'OFF' at the same time.

Observation:-

V_i (p-p) in volts	V_o (p-p) in volts	$V_m = V_o$ (p-p)/2 in volts	$\eta = \frac{\pi V_m}{4 V_{cc}} \times 100\%$
0.01V	1.32V	0.66 V	51.81%

Calculations:-

$$V_m = \frac{V_o}{2} = \frac{1.32}{2} = 0.66V$$

$$\eta = \frac{\pi V_m}{4 V_{cc}} \times 100\%$$

$$= \frac{3.14 \times 0.66}{4 \times 0.01} \times 100\%$$

$$= 51.81\%$$

Questionaries:-

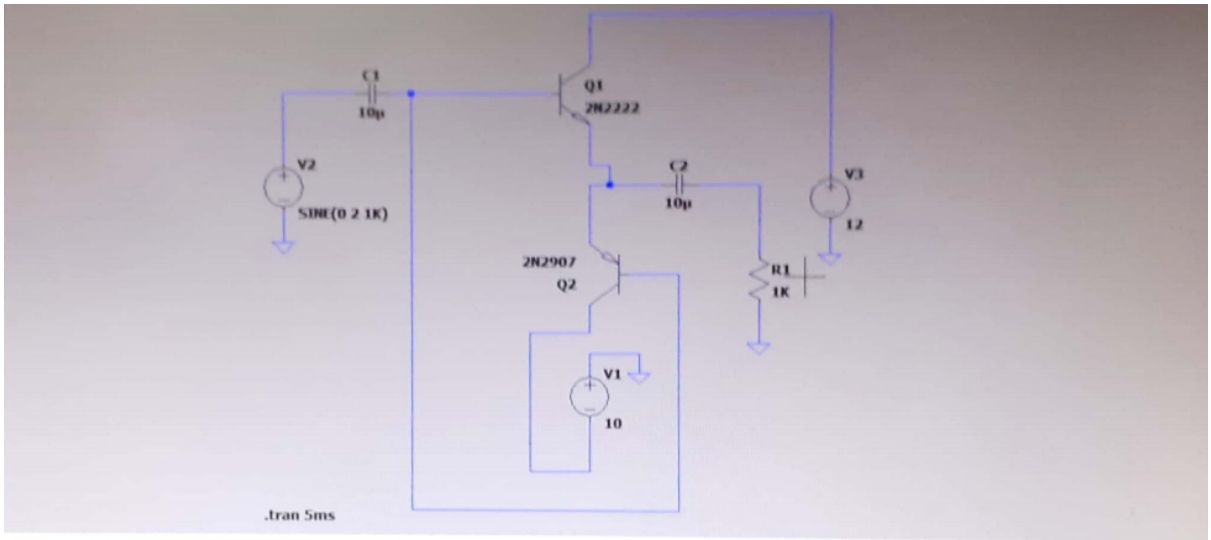
(Q1) What is crossover distortion in a pushpull power amplifier?

(Ans) Crossover distortion is the term given to a type of distortion that occurs in a pushpull class AB or class B amplifiers. It happens during the time that one side of the o/p stage shuts off and the other transistor turns on.

(2) Differentiate b/w class A and class B amplifiers.

Ans) Class A :- single-ended; the amplifier device is biased about the centre of input signal swing.

Class B :- Push pull, each device conducts over half the i/p signal of swing. It conducts for only a short portion of each input cycle.


C1
10µ
Q1
2N2222
V2
SINE(0 2 1K)
C2
10µ
V3
12
2N2907
Q2
R1
1K
V1
10
.tran 5ms


V(n005)
1.5V
1.2V
0.9V
0.6V
0.3V
0.0V
0.3V
0.6V
0.9V