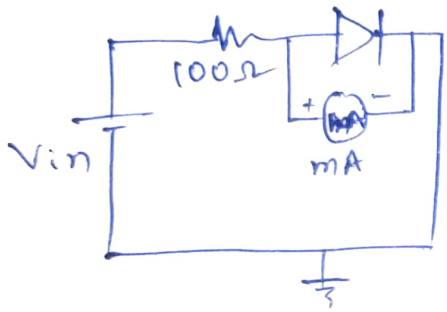
Exp-2

AIM → VI characteristics of PN junction diode.

App → DIN4002, 100Ω resistor, power supply, breadboard, connecting wires, current meter

Circuit diagram →

Forward bias.



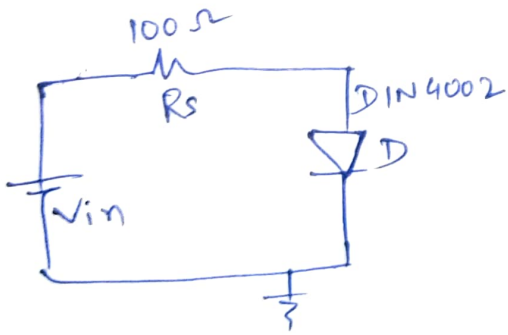
Observation

Vin(V)	I_D(mA)
0.1	
0.2	
⋮	
1V.	

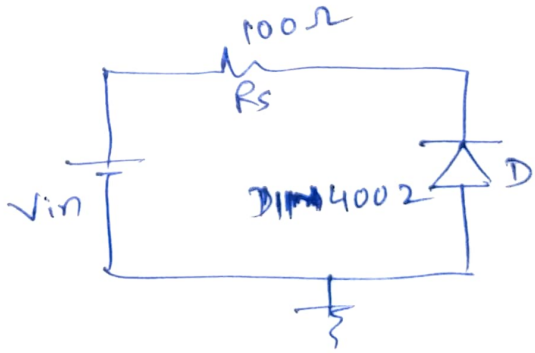
Graph

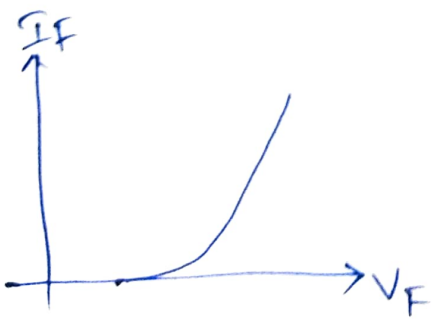
PSPICE PRINTOUT

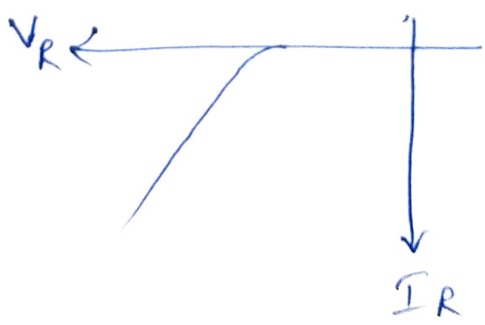
Forward bias



Reverse bias







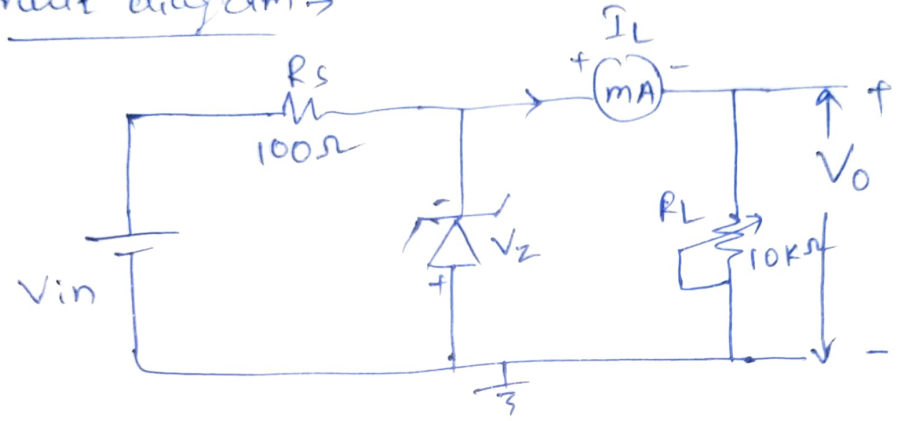
Conclusion →

Exp - 3

Aim → Zener diode as a regulator

App → power supply, 100Ω resistor, 10KΩ potentiometer, zener diode, current meter, breadboard, connecting wires, Digital Multimeter.

Circuit diagram →



Observation

Load Regulation

V_{in} = 5V

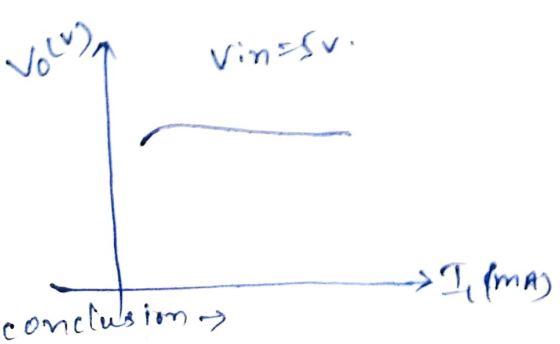
I_L (mA)	V_o (V)
1 mA	
2 mA	
3 mA	
⋮	
7 mA	

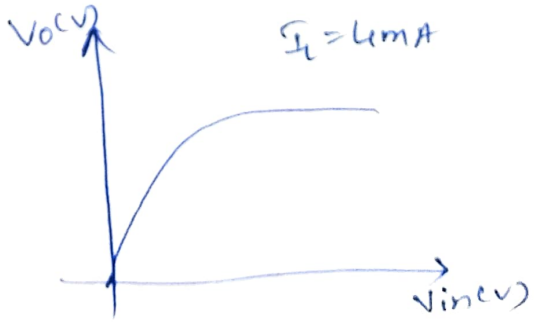
Line Regulation

I_L = 4mA

Vin (V)	V_o (V)
1V	
2V	
3V	
⋮	
7V	

Graph





conclusion →

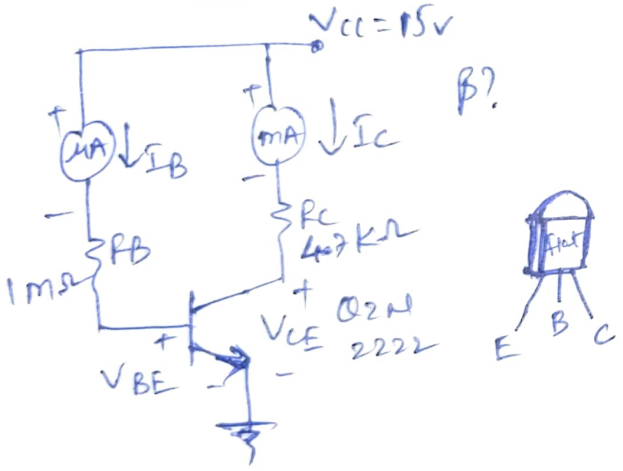
Exp - 4

Aim → Stability factor of BJT fixed bias with & without feedback (ie. R_E)

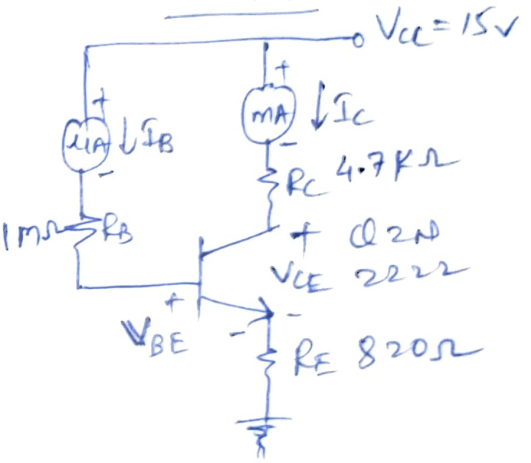
App → Power supply, breadboard, connecting wires, Resistors 1MΩ, 4.7KΩ, 820Ω, current meter (μA, mA), Digital multimeter, Q2N2222

Circuit diagram

without R_E



With R_E



Observation

	I_B (μA)	I_C (mA)	V_{CE} (V)
Obs.			
Calculated.			

	I_B (μA)	I_C (mA)	V_{CE} (V)
Obs.			
Calculated			

Calculation

$$I_B = \frac{V_{CC} - V_{BE}}{R_B}$$

$$I_C = \beta I_B$$

$$V_{CE} = V_{CC} - I_C R_C$$

$$I_B = \frac{V_{CC} - V_{BE}}{R_B + (1+\beta) R_E}$$

$$I_C = \beta I_B$$

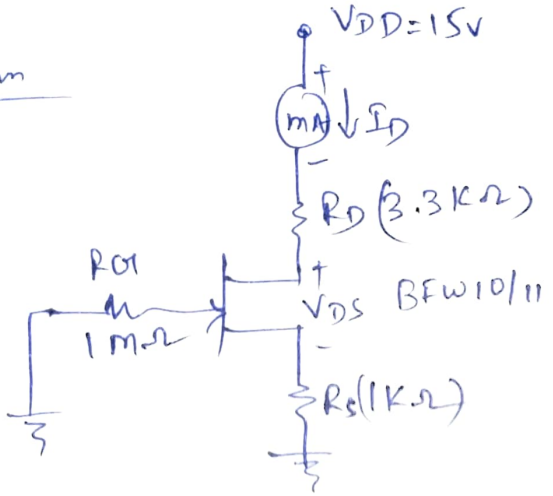
$$V_{CE} = V_{CC} - I_C (R_C + R_E)$$

Exp-5

Aim – Q point of JFET using self bias.

App → power supply, breadboard, connecting wires, Resistors 3.3KΩ, 1MΩ, 1KΩ, current meter, Digital multimeter, BFW 10/11.

Circuit Diagram



Substrate folded then clockwise GDS

Observation

	I_D (mA)	V_{GS} (V)	V_{DS} (V)
Observed			
Calculated			

Calculation $I_{DSS} = 8mA$ & $V_P = -2.5V$

$$V_{GS} = -I_D R_S$$

$$I_D = I_{DSS}\left[1 - \frac{V_{GS}}{V_P}\right]^2$$

$$0 = A I_D^2 + B I_D + C$$

select lower value of I_D.

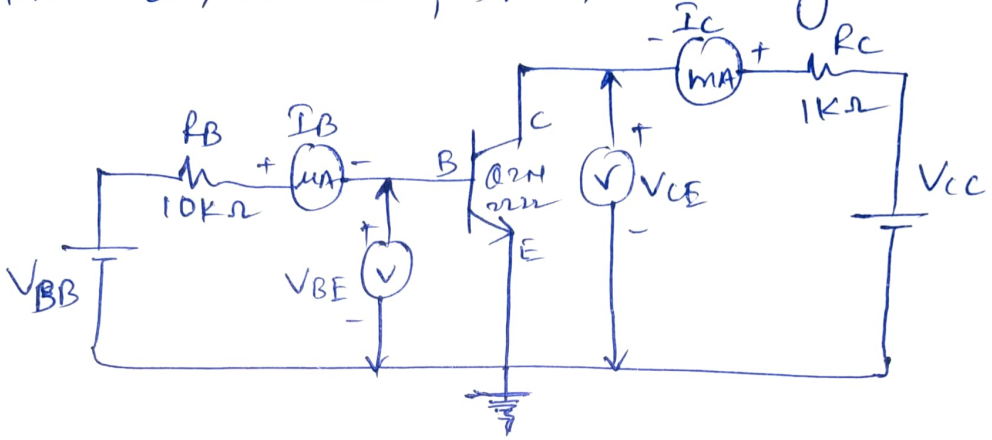
$$V_{DS} = V_{DD} - I_D (R_D + R_S)$$

Exp - 6

AIM → Input & output characteristics of CE configuration & find 'h' parameter.

APP → Q2N2222, resistors 10KΩ, 1KΩ, breadboard, power supply, Ammeter, voltmeter, DMM, connecting wires.

Circuit diagram →



Observation

i/p characteristics.

$V_{CE} = 2V$ | $V_{CE} = 5V$

V_{BE}(V)	I_B(μA)
0.1V	
0.2V	
⋮	
1V.	

$V_{BE} = h_{ie} I_B + h_{re} V_{CE}$ (1)

$I_C = h_{fe} I_B + h_{oe} V_{CE}$ (2)

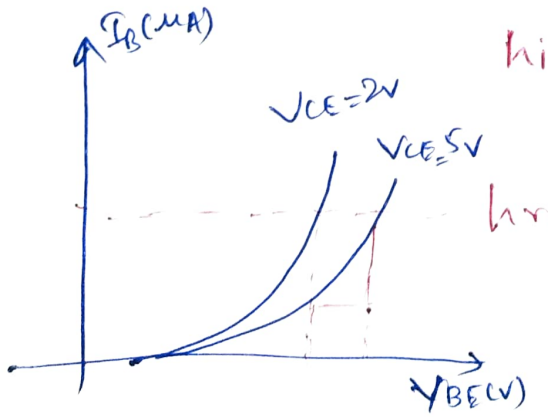
o/p characteristics

$I_B = 50\mu A$ | $I_B = 100\mu A$

V_{CE}(V)	I_C(mA)
1V	
2V	
⋮	
10V	

Graph

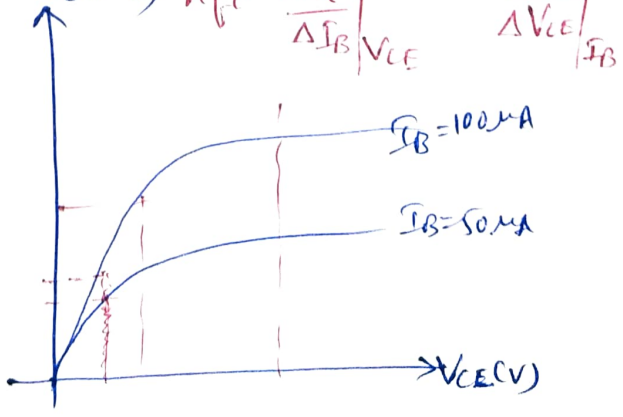
i/p chara.



$h_{ie} = \left.\frac{\Delta V_{BE}}{\Delta I_B}\right|_{V_{CE}}$

$h_{re} = \left.\frac{\Delta V_{BE}}{\Delta V_{CE}}\right|_{I_B}$

o/p chara



$h_{fe} = \left.\frac{\Delta I_C}{\Delta I_B}\right|_{V_{CE}}$

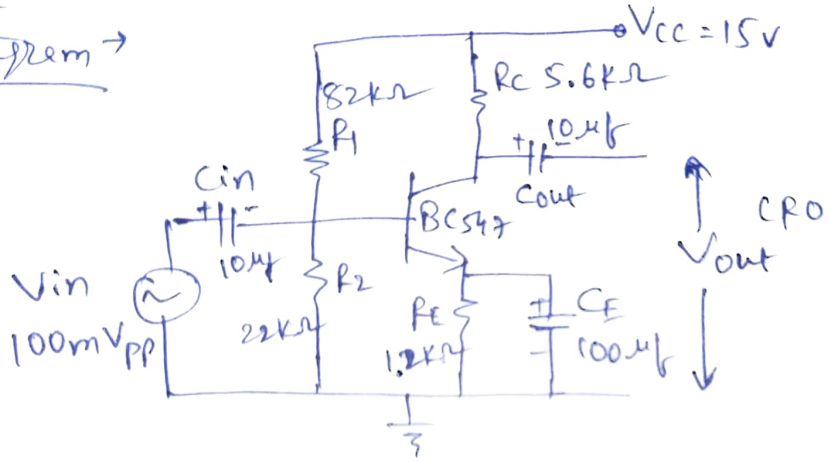
$h_{oe} = \left.\frac{\Delta I_C}{\Delta V_{CE}}\right|_{I_B}$

Exp - 7

Aim → Frequency Response of CE amplifier.

App → Resistors, 82KΩ, 22KΩ, 5.6KΩ, 1.2KΩ, Capacitors 10μF, 100μF, BC547, function generator, power supply, CRO, Breadboard, connecting wires.

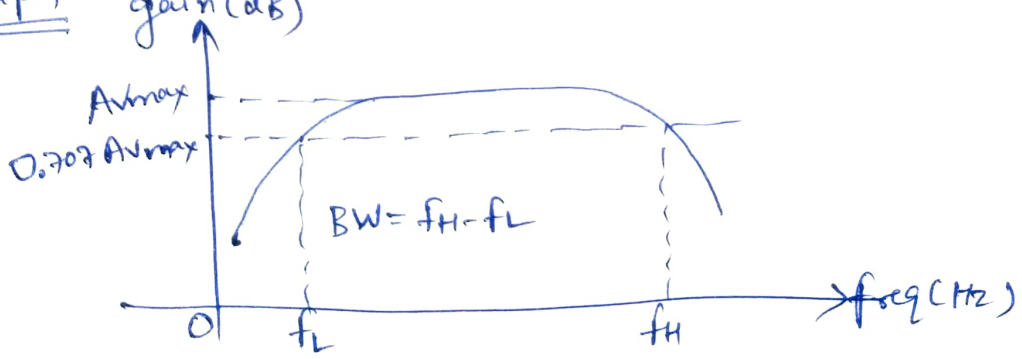
Circuit diagram →



Observation Vin = 100mVpp

Freq (Hz)	Vo (V)	gain (V_o/V_i)	gain dB $20\log(V_o/V_i)$
10			
20			
⋮			
100			
900			
⋮			
1K			
2K			
⋮			
10K			
⋮			
1MHz			

Graph

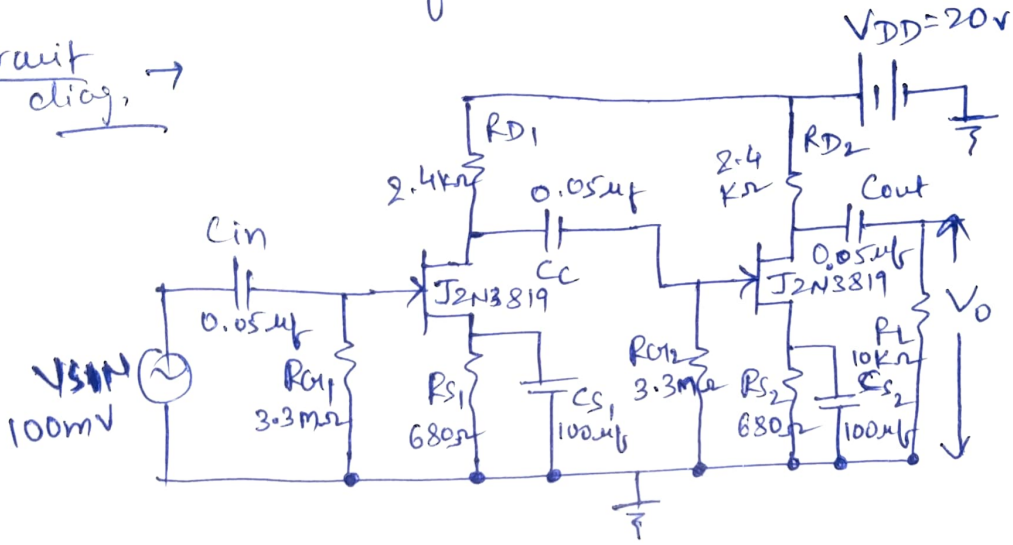


Exp- 8

Aim → Frequency response of CS-CS amplifier. [Multistage amplifier].

Atp → PSPICE Software. For resistor meg

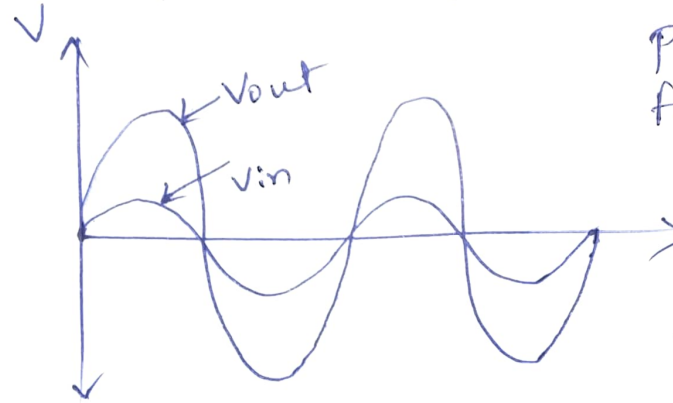
Circuit diag. →



Printout i/p & o/p wave form.

VSIN

DC = 0V
AC = 100mV
VOFF = 0
Vamp = 50mV
freq = 1KHz



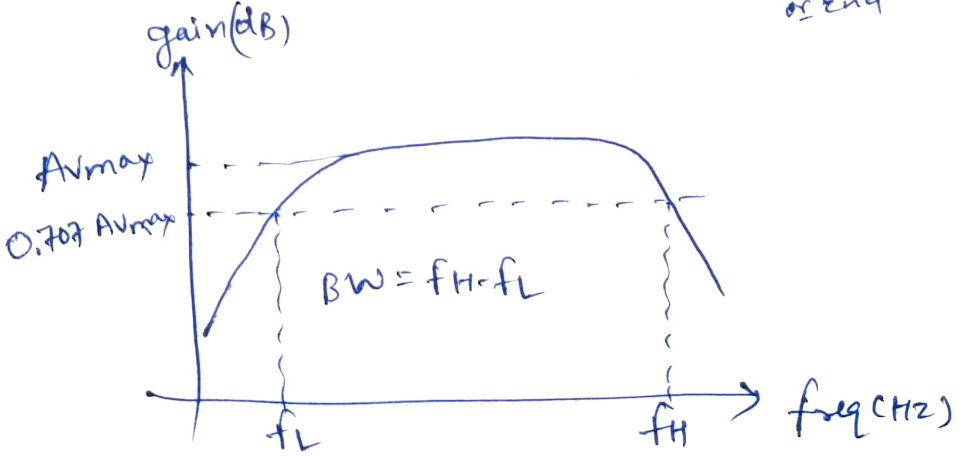
Transient

Print step = 0ms
final step = 5ms.

AC sweep

AC sweep type:
• Decade
Sweep parameters:
pts = 101
Start = 10Hz
Final = 100Meg
or End

Freq. Response



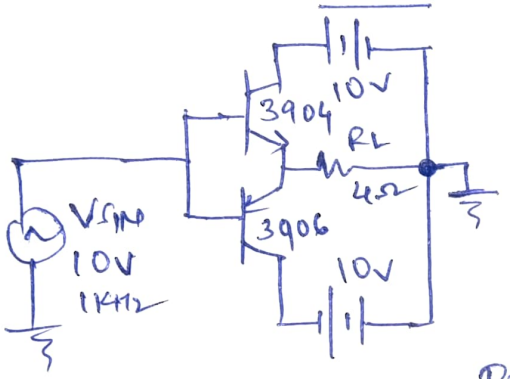
Exp-9

AIM → Class B & class AB poweramplifier.
Observe cross over distortion & remove it.

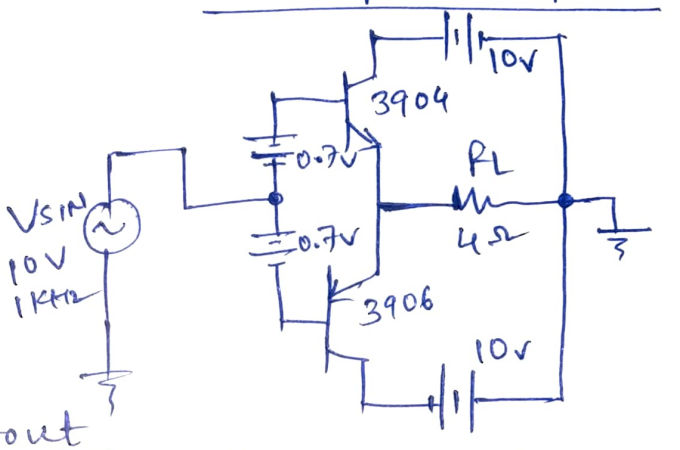
APP → PSPICE Software. Calculate Efficiency.

Circuit diagram →

Class B power amp

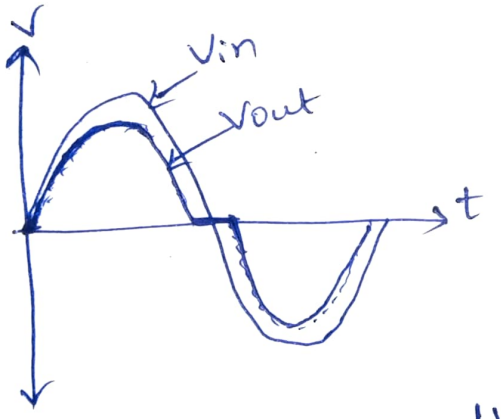


Class AB power amplifier

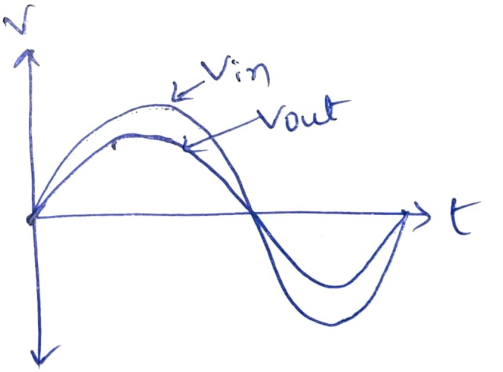


Printout

i/p o/p waveform



i/p o/p waveform



Calculation $P_{o(ac)} = \frac{|V_{o(peak)}|^2}{2R_L} =$

$P_{i(dc)} = \frac{2 V_{o(peak)} \times V_{cc}}{\pi R_L} =$

% Efficiency $\% \eta = \frac{P_{o(ac)}}{P_{i(dc)}} \times 100 =$

Calculate for Both