Course Details

Instructor Name * Sir Mujtaba ihsan

Course Name * Electronic circuit device.

Student Details.

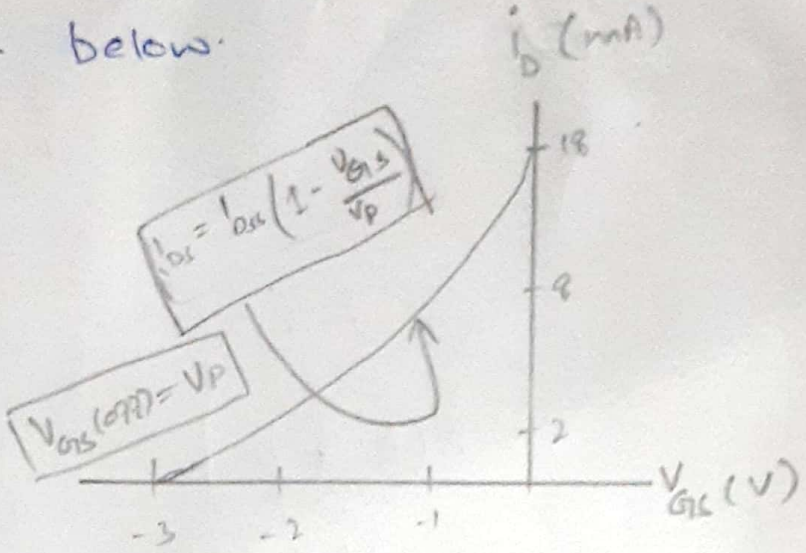
Name Faiz ur Rehman

ID 14623

Semister/Module 4th

Student sign

Q1) Explain the trans conductor ---- n-channel JFET given below.



Transconductance curve IE JFET transistor graph of drain current, ID for a given change in gate to source voltage (delta-VGS) with the drain to source voltage const.

* unit of siemens (s)

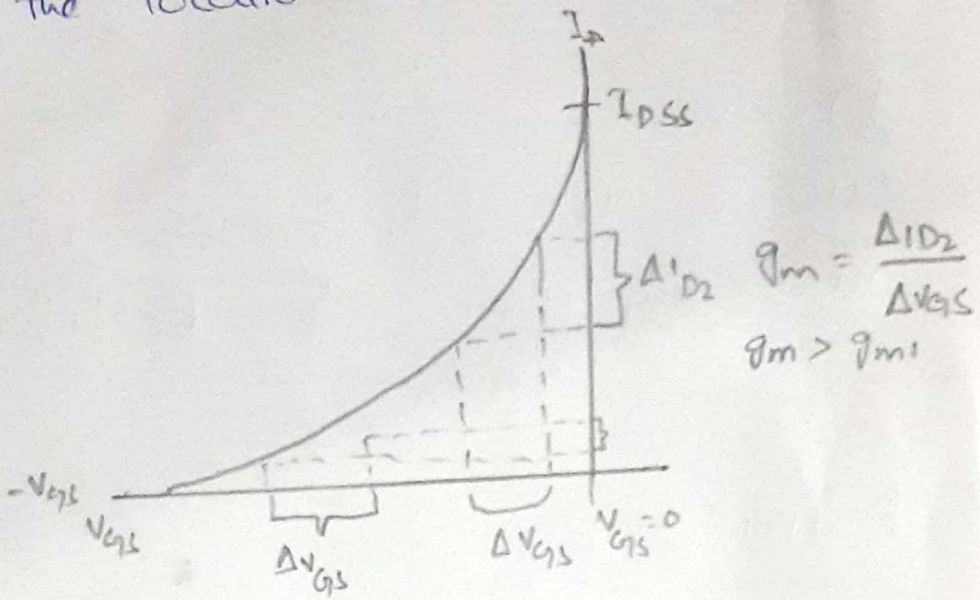
* g_m = delta - ID / delta - VGS

* g_m = Δ - ID / Δ - VGS

Other common designation for parameter are gfs & Yfs (F. Transfer admittance). gm is important factor in determining the voltage gain of FET amplifier

Because the transfer characteristic curve for JFET is nonlinear, gm varies in value

depending the location on curve JFET.



Datesheet normally give the value of gm measured V_{GS} = 0V (g_{m0}) of the mho is same unit siemens (s) V_{DS} = 15V

Equation

when a value g_{m0} is not availbale, you can calculate it using IDSS & $V_{GS(OFF)}$

* Vertical line show an absolute value (no sign)

Equation

input Resistance & capacitance.

when the vertical line indicate absoulate value (no sign)

$R_{IN} = V_{GS}/I_{GSS}$.

Q2 State the characteristic of a Practical operational amplifier.

Characteristic of a practical op amplifier.

Various characleristic of practical op-amplifier is given below.

(1) Open loop gain:

it is the voltage gain of the op-amp when no feedback is practically it is servel thousand.

(2) input impedance:

it is finite and typically greater than ~~1MΩ~~. 1 MΩ. But using FETs for the inpout stage. it can be increased upto serval hundred M.

(3) output impedance:

Typically few hundred ohms. with the help of negative feedback, it can be reduce to a very small value like 1 or 2 ohms.

(4) Slew Rate :- (SR)

it is define as the maximum Rate of change of output voltage w.r.t time

$$SR = \left[\frac{dv_o}{dt}\right]_{max}$$

For practical op. amp

0.5 V/μs

For ideal op-amp it is infinite.

(5) Bandwidth :-

The bandwidth of practical op-amp in open loop ~~are~~ configuration is very small. By application of negative feedback, it can be increased to a desired value.

Q3 Calculate output voltage for summing amplifier if $V_1 = 0.2V$, $V_2 = 0.5V$ and $V_3 = 2V$ and $R_1 = R_2 = R_3 = R_f = 6K\Omega$

Given Data:

$V_1 = 0.2V$

$V_2 = 0.5V$

$V_3 = 2V$

~~$R_1 = R_2 = R_3 = R_f = 6$ k ohms~~

$R_1 = R_2 = R_3 = R_f = 6K\text{ohms}$

Required:

$V_{out} = ?$

Solution:->

Formula: $V_{out} = -(R_f/R)(V_1 + V_2 + V_3 \cdots)$

$\Rightarrow -\left(\frac{6K\Omega}{6K\Omega}\right)(0.2V + 0.5V + 2V)$

$\Rightarrow -(2.7)V$

$\Rightarrow -2.7V$

Qu (a) Part.

You are working on an audio circuit in the lab. - - - - - - ? justify your answer with reason.

Class A

Class A is always ON. Used for "signal" level circuits (where power requirements are small) b/c the maintain low distortion. They are very inefficient & are rarely used for high power designs. 75% or more of the supplied power is dissipated by DC.

Class B

Peak efficiency of class B. output stage 78.5%. much higher than class A. class B amplifier are used in low cost design or design sound quality not important.

* Class B amplifiers significantly more efficient than class A.
* Class B amplifiers common in clock radio circuit. pocket transistor radio.

Class C :

* common used RF circuit
* class C amplifier never used audio ea circuit.

Class C amplifier operate output transistor in a state that result in tremendous distortion.

* Totally unsuitable for audio ~~cir~~ reproduction.
* class C is not able for audio circuit.