Course Title :- ECD

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Module :- 4th Semester.

-: Student Detail :-

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Ans No. 1:-

The transconductance curve of a JFET transistor is the graph of the drain current, ID verse the gate-source voltage, VGS.

The ratio of change in drain current, ΔID, to the change in gate-source voltage, ΔVGS, is the transconductance, gm.

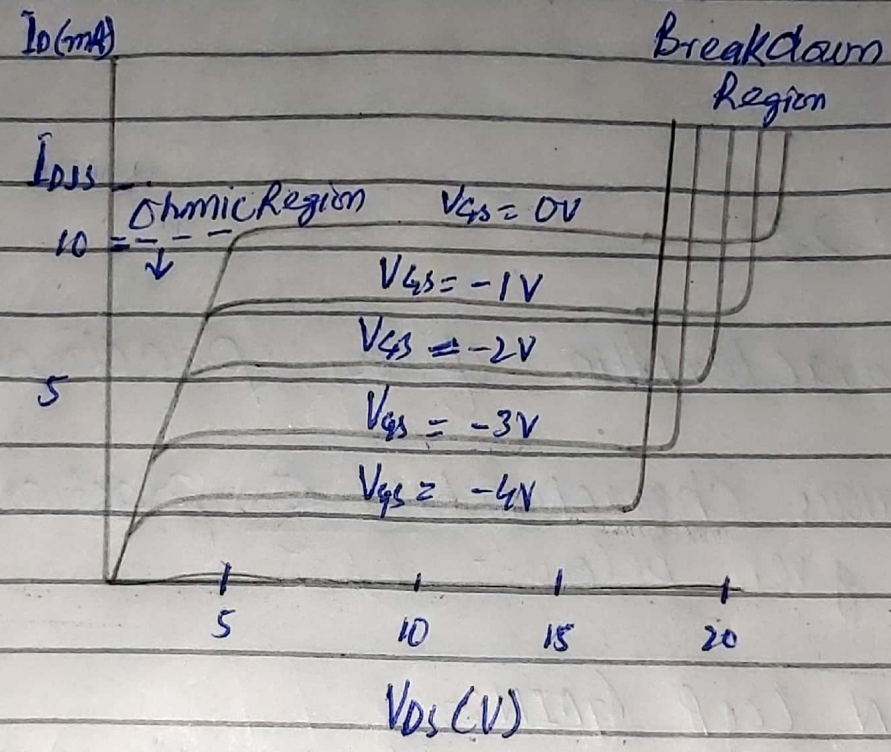
The units of transconductance is the siemen (S). It is the reciprocal of resistance (Ω).

The transconductance curve, as for all semiconductor devices, is nonlinear, for most of the curve, meaning changes to VGS do not directly increase or decrease drain current, ID.

Below are the transconductance curve of N-channel JFET transistors and P-channel JFET Transistors.

The Regions that make up a transconductance curve are the following-

N-Channel JFET Characteristics Curve-



→ Cut of Regions:-

This is the region where the JFET transistor is off, meaning no drain current, ID flows from drain to source-

→ Ohmic Region:-

This is the region where the JFET transistor begins to shows some resistances to the drain current, ID that is beginning to flow from drain to source- This is the only region in the curve where the response is linear-

Ans NO. 2:-

→ Characteristic of a practical OP-amplifier:-

Various characteristic of practical OP-amplifier is given below:-

(1) OPEN LOOP GAIN:-

It is the voltage gain of the OP-amplifier when no feedback is practically it is serval thousand.

(2) Input Impedance:-

It is finite and typically greater than 1M.Ω. But using FETs for the input 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.

(9):- Slew Rate (SR) :-

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

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

Ans NO. 3 :-

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

$$V_{out} = -\frac{6k\Omega}{6k\Omega}\,(0.2 + 0.5 + 2)$$

$$\boxed{V_{out} = -2.7}$$

Ans No.4 [Part B] :-

Outline the differentl between an Amplifier and Reactifier.

→ Amplifier:-

An Amplifier is used to increase the strength of an electric signal-

→ Reactifier:

Where as a rectifier allow current to pass only one direction and is used to produce Dc from Ac-