Course Title :-

ELECTRONIC CIRCUIT DESIGN

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Module :-

4th Semester

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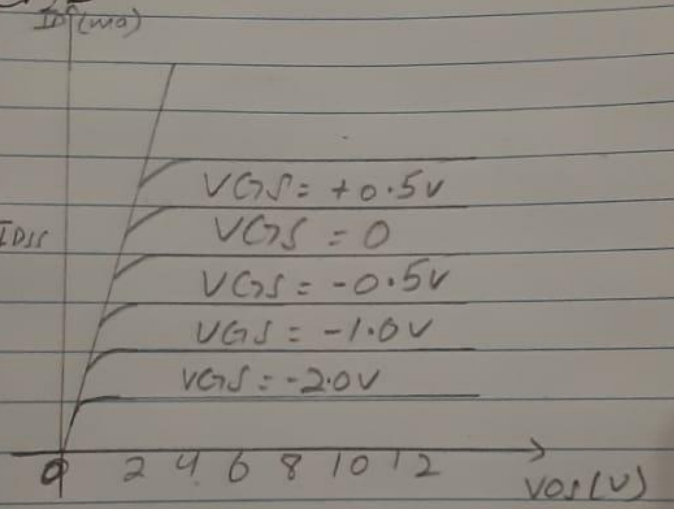
Signature :-

Question 1:-

Explain the drain characteristic curve of D-MOSFET given below:

Answer:-



Drain characteristics is the characteristics between current and voltage VDS for various voltage VGS.

As ID is the voltage VDS for various

As ID is the output current and VDs is output voltage and various voltage is the input voltage.

* When VDs is increased ID(mA) will also increase.

* When VGs = 0V the pinch off occur.

* When we increase VGs positive i.e 0.5V the gate terminal becomes positive the free charge carrier electron in the P type attracts towards the gate and the channel will have more electrons so the current will increase.

So, Increase in VGs cause IDs increase.

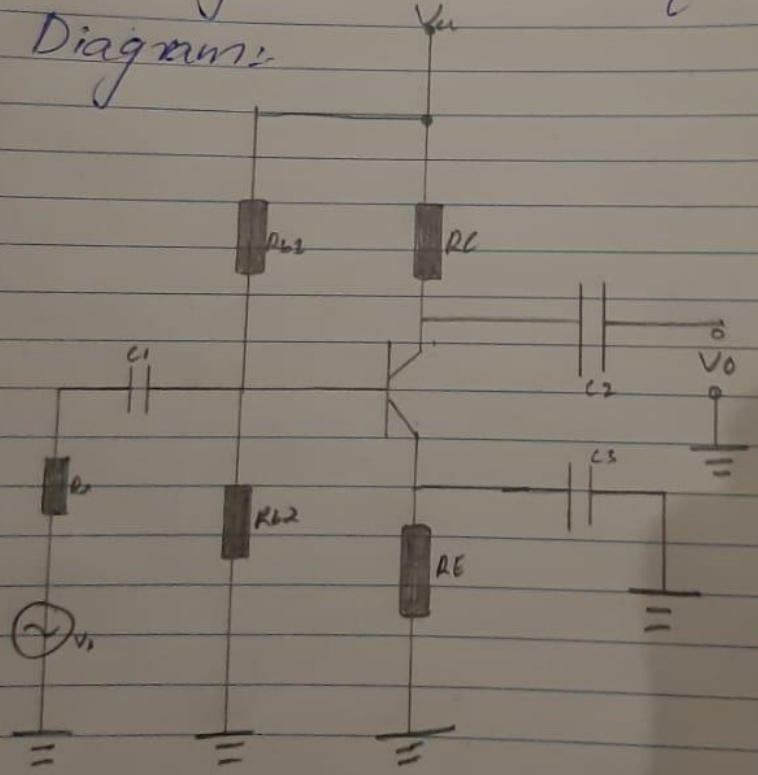
Question 1(b):-

Sketch the hybrid model and write equations for the transistor in common emitter configuration?

Answer:-

Hybrid model of Transistor

Diagram:



Equation:

$$h_{ie} = \frac{V_{be}}{I_b}$$ — input impedance

$$h_{re} = \frac{V_{be}}{V_{ce}}$$ — Reverse voltage ration

$$h_{fe} = \frac{I_C}{I_b}$$ — Forward current gain

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Q2(b):-

A certain operational amplifier has a common mode gain of 0.6 and an open loop differential voltage gain of 400,000. Evaluate the CMRR & express it in decibels.

Answer:

Given:-

Open Loop differential voltage gain is

400,000

Common mode gain = 0.6

Required:-

CMRR = ?

Solution:-

Formula:- $A_{ol}/A_{CM} = CMRR$.

CMRR = 400,000/0.6

= 666,666.667

CMRR in decibles:

CMRR = 20 log(Aol/Acm)

= 20 log(666,666.667)

= 116.47817...

Question 3:-

Explain the concept behind negative feed back in operational amplifiers?

Answer:-

Negative feed back is the voltage process where by a portion of the output voltage of an amplifier is returned to the input with a phase angle that opposes (or subtract from) the input signal."

Negative feed back in op amp.

Concept:

As an amplifier we have with a very large number and

and the output of the amplifier is extremly high than the output to the input for stabilization. because it has a very high gain a is not stable. for stabilization we use negative feed back. in op amplifier.

Question No 3.(b)

Answer:-

"The output of summing amplifier is positive" This statement is wrong because summing amplifier is an application of inverting operational amplifier configuration which has more than one inputs and its output will be negative.