

Course Details

Course Title

Electronic Circuit Design

Module

4th

Instructor

Sir Mujtaba Ihsan

Student Details

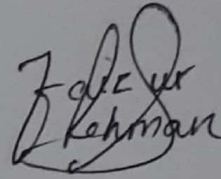
Name

Faiz-ur-Rehman

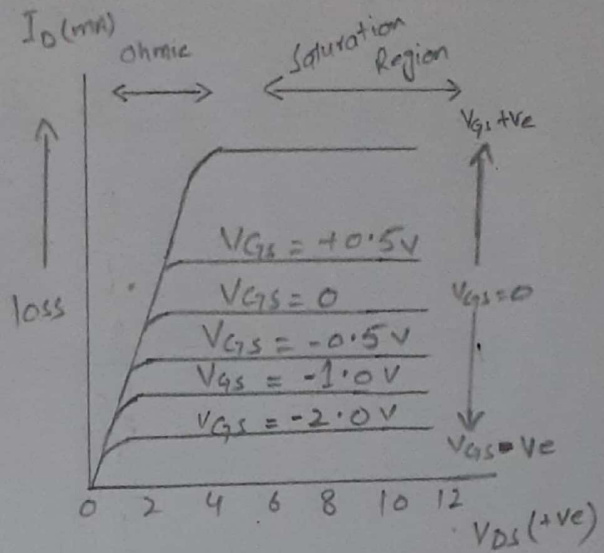
Student ID

14623

Student Signature



Part (a)



Drain characteristic is characteristic between Drain current & voltage V_{DS} for various Voltage V_{GS}

As I_D is the output current and V_{DS} is the output voltage & various Voltage is the input voltage.

- When V_{DS} is increased I_D (mA) will also increased
- When $V_{GS} = 0V$ the pinch off occur.
- When we increase V_{GS} positive i.e. $0.5V$ the gate terminal become +ive the free charge carrier electron in the p-type attracted toward the gate. and the channel will have more electron so the current will increase.

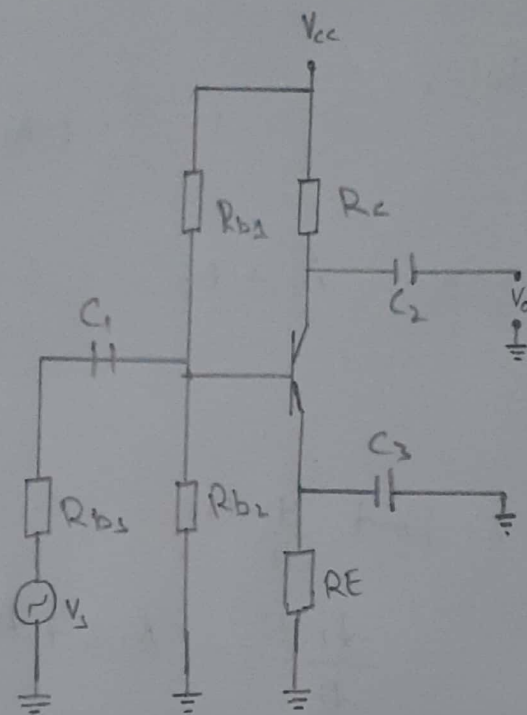
So increase in V_{GS} cause I_{DS} increase.

Part (b)

Hybrid mode of transistor

Diagram :-

Equation :-

Diagram

Equation

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

$$h_{re} = \frac{V_{be}}{V_{ce}} \rightarrow \text{Reverse voltage ration.}$$

$$h_{fe} = \frac{I_c}{I_b} \rightarrow \text{forward current gain.}$$

Solution Answer

Given

open loop differential voltage gain is
400,000

Common mode gain = 0.6

Required

$$CMRR = ?$$

Solution.

Formula

$$CMRR = A_{ol} / A_{cm}$$

$$CMRR = 400,000 / 0.6$$

$$\Rightarrow 666,666.667$$

CMRR is decibels

$$CMRR = 20 \log (A_{ol} / A_{cm})$$

$$\Rightarrow 20 \log (666,666.667)$$

$$\Rightarrow 116.47 \text{ dB}$$

Part (a)

Negative Feed back

Negative Feedback is the Process where by a portion of object output voltage of an amplifier is returned to the ~~output~~ input with a phase angle that opposes (subtract from) the input signal." Negative feed-back in op amp

Concept:

An amplifier we have with a very large number β the output of the amplifier is extremely high than the input. So we take connect from the output to the input for stabilization because it has very high gain is not stable. For stabilization we negative feedback in op-amplifier.

Part b

The output of summing amplifier is positive" This statement is false because

Summing Amplifier is an application of inverting operational amplifier configuration which has more than one input its output will be negative.

The summing is connected to inverted input the op amplifier the circuit will produce the negative sum of ~~any~~ the input voltage. Likewise when the summing is connect to non-inverted input the op amplifier the circuit will produce the positive sum of the input voltage.