Assignment 12

Problem 12.1

A simple voltage amplifier using an FET is shown in the diagram below. The circuit parameters are as follows:

- $V_{dd} = 12V$
- $R_1 = 10k\Omega$
- $R_2 = 5k\Omega$
- $V_{in} = 1V$
- $R_F = 100k\Omega$
- $I_{DSsat} = 200\mu A$

Determine the output voltage $V_{out}$ when $V_{in} = 1V$.

Problem 12.2

Sketch the transfer characteristic curve of a JFET, indicating the following regions:

- Linear region
- Saturation region
- Reverse bias region

Problem 12.3

In the circuit shown, determine the value of $V_{DS}$ and $I_{DS}$ when $V_{in} = 1V$.

Problem 12.4

A simple inverting amplifier using a BJT is shown in the diagram below. The circuit parameters are as follows:

- $V_{cc} = 12V$
- $R_1 = 10k\Omega$
- $R_2 = 5k\Omega$
- $V_{in} = 1V$
- $I_{cmax} = 500\mu A$

Determine the output voltage $V_{out}$ when $V_{in} = 1V$.