**Reg. No. 21BCE1297 Name: Vidhi Shah Date of Practical: 13/04/22**

**Experiment 7**

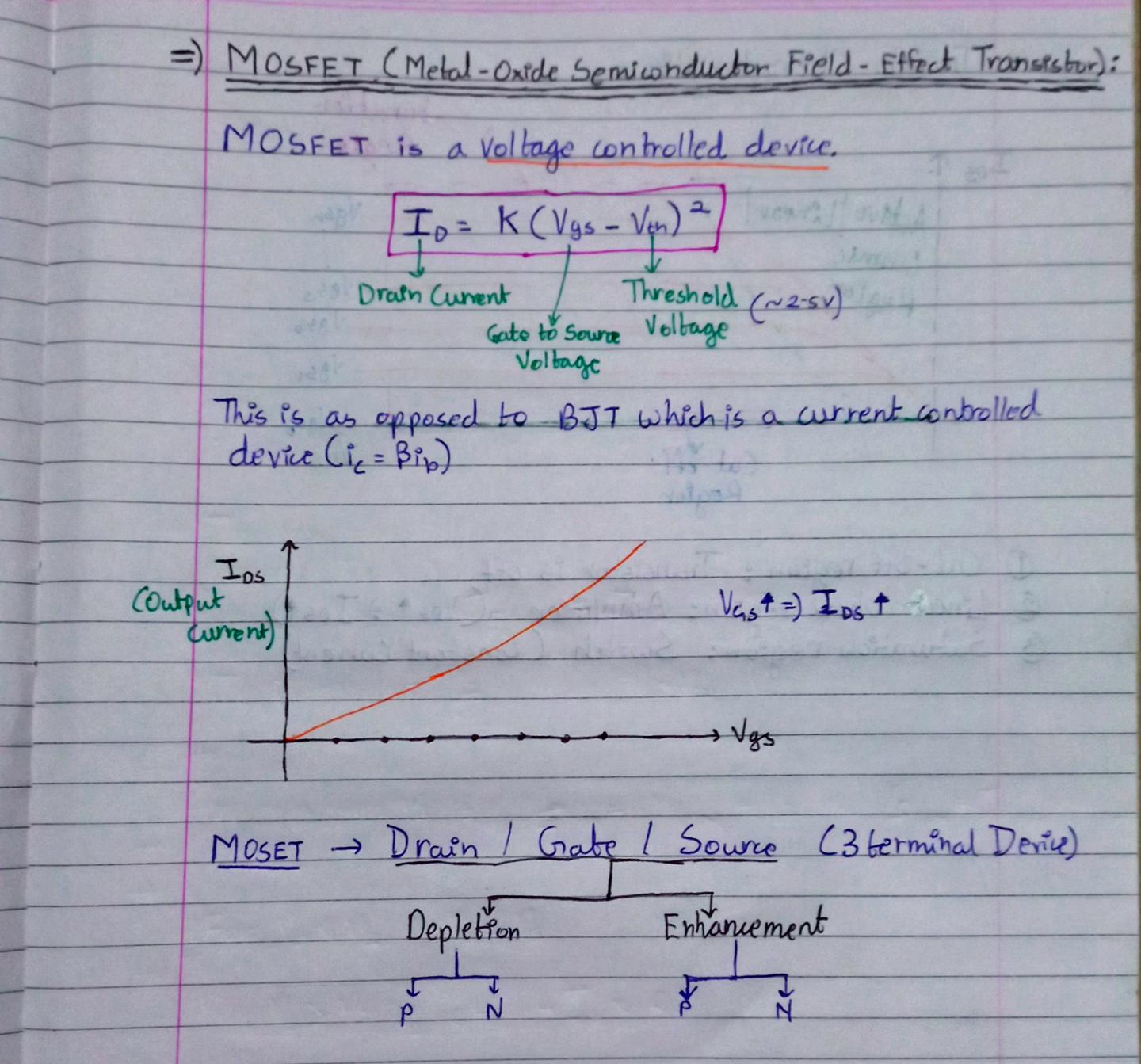
**Aim:**

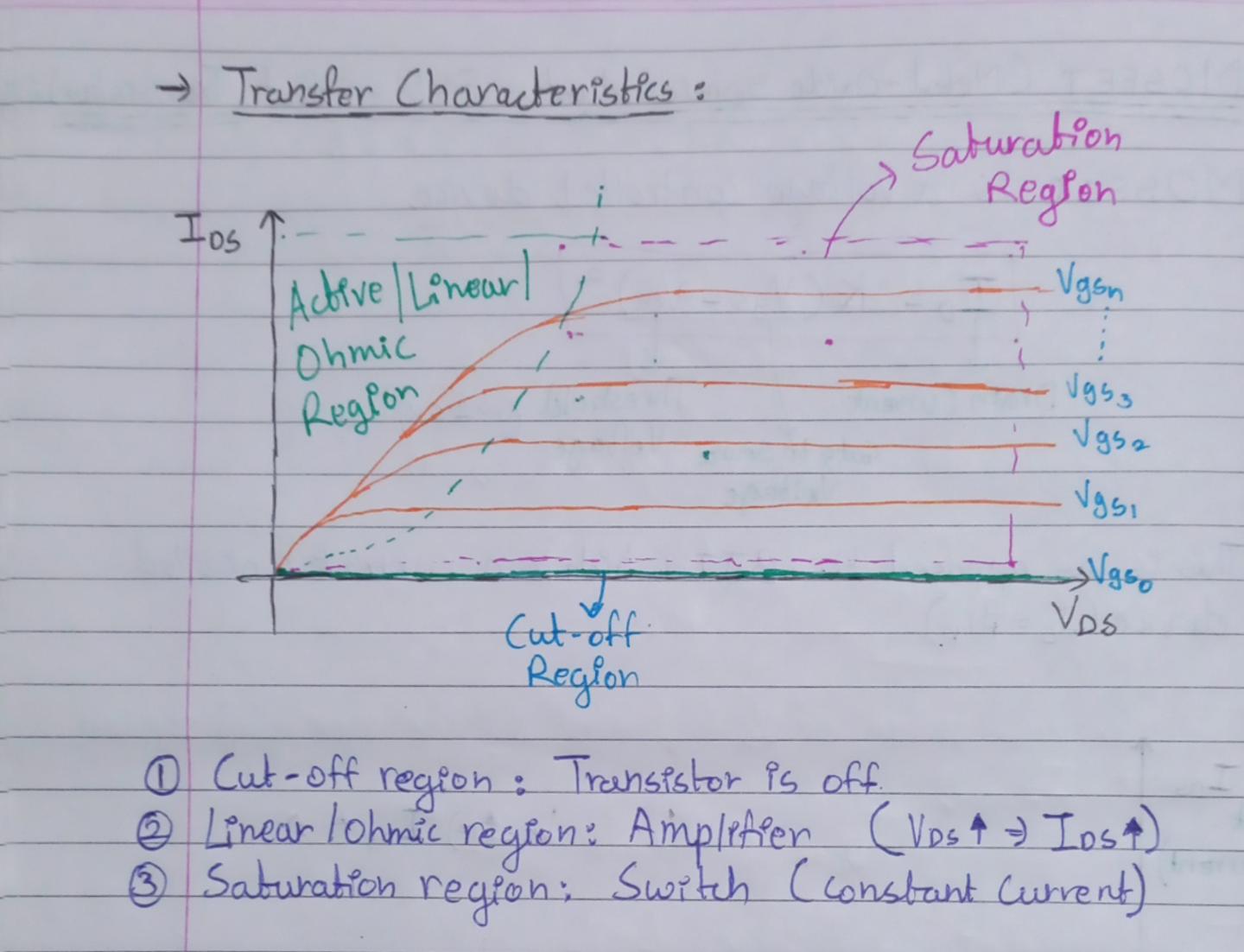
Study and simulation of MOSFET (Metal-Oxide Semiconductor Field-Effect Transistor) characteristics using LTSpice.

**Tools and Apparatus:**

­LTSpice, MOSFET Transistor, Resistors, Voltage Sources

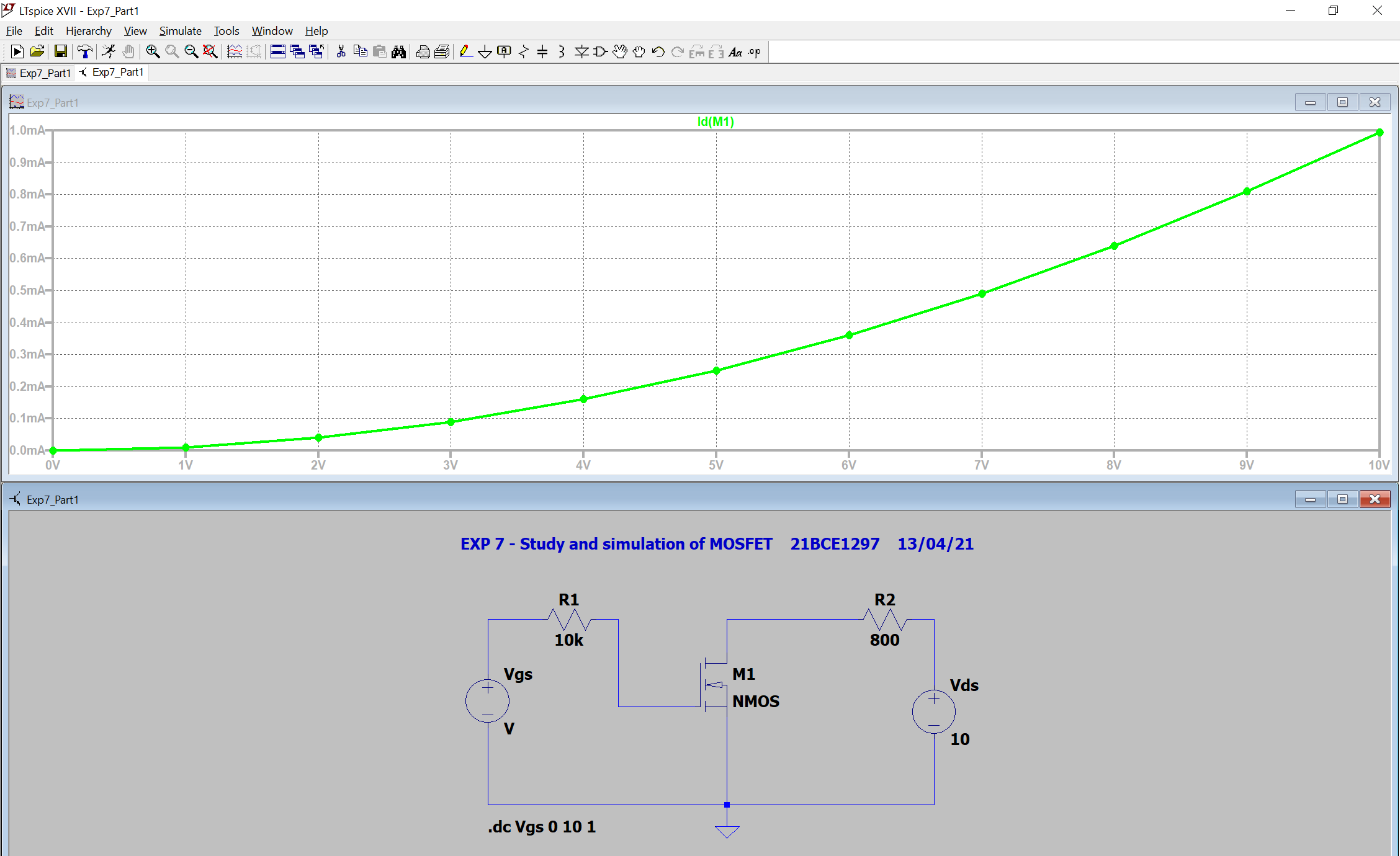
**Theory and Design:**



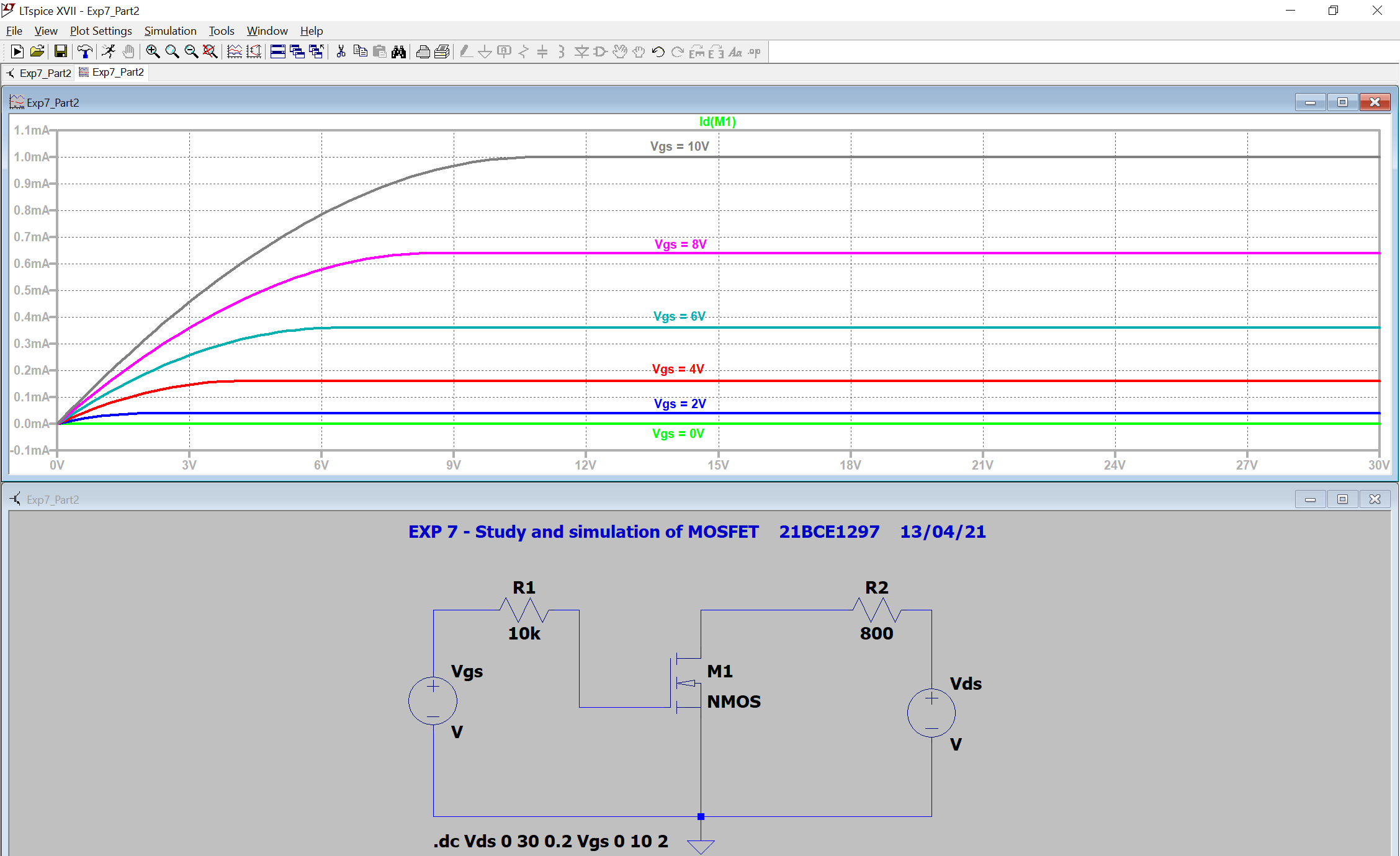


**Simulation Results:**

1. **Output Characteristics**

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1. **Transfer Characteristics**

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**Conclusion:**

1. **Output Characteristics:**

* IDS increases as VGS increases.

1. **Transfer Characteristics:**

* IDS increases linearly with respect to VDS in Active/Linear/Ohmic region.
* IDS remains constant with respect to VDS in Saturation region.

**Inferences:**

1. **IDS = K (VGS-VTH)2**
   1. Therefore, IDS increases as VGS increases in output characteristics of MOSFET
2. VGS = 0V is **Cut Off Region**:
   1. Transistor is in **off** state.
3. **Linear/Ohmic Region**:
   1. Transistor acts as an **amplifier** as **current increases** with increase in voltage
4. **Saturation Region**:
   1. Transistor acts as a **switch** as **current remains constant** with respect to voltage
5. In transfer characteristics keep first source as VDS and second source as VGS.