# EE 735 Assignment – 7

# Hspice Simulation

# Non Extendible Deadline: 8 Apr 2025 11:59 pm (100% Penalty for Late Submission)

### **General Instructions:**

- Submit all codes and report in a single zip file.
- Name of the file should be EE735\_A7\_Rollno\_Name.
- MOSFET terminals in HSPICE should follow the same order as modeled in Verilog-A
- You can use any plotting software (MATLAB, Python, Excel etc.)
- Plots should contain title and appropriate axes labels.
- References Semiconductor Device Fundamentals by Robert F. Pierret

# **Question 1**:

#### Simulating RC Low pass filter

- Design an RC low pass filter with 3 dB frequency of 7kHz.
- Carry out AC analysis to verify the results.
- Draw the circuit with proper labels of the elements and nodes.

# **Question 2**:

#### **NMOS inverter**

- Design a simple n-channel MOSFET by current equations.
- Verify by plotting Input and Output Characteristics.
- Design an NMOS inverter and verify it by putting square pulse.

# **Question 3**:

#### **CMOS** inverter

- Design a CMOS inverter using NMOS and PMOS.
- Verify it by same square pulse as in the above question.
- Observe and compare outputs of both the inverters.