



VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Vellore – 632014, Tamil Nadu, India
SCHOOL OF ELECTRICAL ENGINEERING
WINTER SEMESTER 2023-2024
CAT-II

SLOT:B1

Programme Name & Branch : B.Tech (ELE)

Course Code:

BECS201L

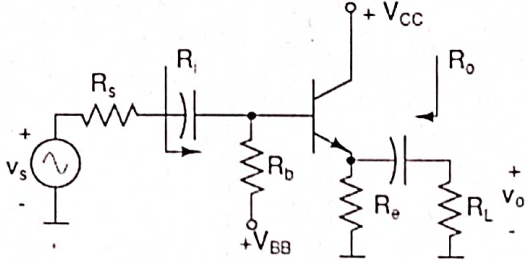
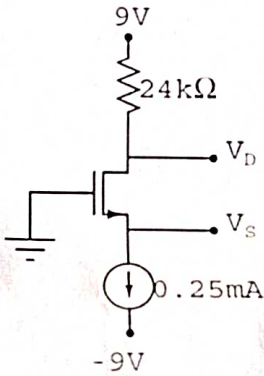
Course Name: Semiconductor Devices and Circuits

Faculty Member: Dr.M.N.Venkataraman

Class Number(s) VL2023240503162

Duration : 90 minutes

Max. Marks : 50

Q. No	Question	Marks
1.	For the common collector amplifier shown in Fig.(1), derive the expressions of A_v, R_i and R_o by assuming the transistor is operating in forward active region. Consider $V_A = \infty$.  Fig.(1)	10
2.	For the circuit in Fig.(2), the transistor parameters are $V_{TN}=0.6V$ and $K_n = 200\mu A/V^2$. Determine V_D and V_S.  Fig.(2)	10

3.	For the circuit shown in Fig.(3), which uses an n-channel enhancement MOSFET, the transistor parameters are $V_{Tn} = 0.8V$ and $K_n = 0.5mA/V^2$. Find V_{GS}, V_{DS}, I_D and region of transistor operation. Fig.(3)	10
4.	Design the integrator and differentiator circuits using ideal op-amps and derive the corresponding expressions.	10
5.	For the op-amp circuit given in Fig.(4), find v_+, v_-, v_o and current through all the resistors. Find the power delivered by 4V source. Fig.(4)	10