REG.NO.:

VIT

Vellore Institute of Technology

SLOT: A2 + TA2

SCHOOL OF ELECTRICAL ENGINEERING
WINTER SEMESTER 2025-2026
CONTINUOUS ASSESSMENT TEST - II

Programme Name & Branch	**: B.Tech. Electrical and Computer Science Engineering**	
Course Code and Course Name	**: BECS201L - Semiconductor Devices and Circuits**	
Faculty Name(s)	**: Dr. Arunkumar G**	
Class Number(s)	**: VL2025260506454**	
Date of Examination	**: 15/03/2026, 09.30 to 11.00 AM**	
Exam Duration	**: 90 minutes**	**Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- Rough work should not be done on question paper. It will be treated as malpractice.
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Course Outcomes Statements:

CO. 3: Comprehend design aspects of amplifier circuits

CO. 4: Analyze the performance characteristics and applications of Op-Amp

Q. No	Question	M	CO	BL
1.	In a BJT CE voltage-divider bias (VDB) amplifier circuit, $V_{CC} = 22\,V$, $R_1 = 15\,k\Omega$, $R_2 = 4.7\,k\Omega$, $R_C = 2.2\,k\Omega$, $R_E = 1\,k\Omega$, $\beta = 200$, $V_s = 10\,mV$, $R_L = 10\,k\Omega$, $R_S = 5\,\Omega$, Determine, Z_i, Z_o, A_v and V_o.	10	3	3
2.	In a E-MOSFET CS voltage-divider bias (VDB) amplifier circuit, $V_{DD} = 40\,V$, $R_1 = 22\,M\Omega$, $R_2 = 18\,M\Omega$, $R_D = 3\,k\Omega$, $R_S = 0.82\,k\Omega$, $k = 0.12\,mA/V^2$, $V_{th} = 5\,V$, $V_s = 5\,mV$, $R_L = 10\,k\Omega$, Determine, Z_i, Z_o, A_v and V_o.	10	3	3
3.	a) In a BJT CE Class A Power Amplifier circuit, $V_{CC} = 15\,V$, $I_{CQ} = 64.1\,mA$, $V_{CEQ} = 5.756\,V$, $V_{Orms} = 2.07\,V$, $R_L = 100\,\Omega$. Determine the e efficiency of the circuit.	5	3	3
	b) In a CE Differential Amplifier circuit, $V_{CC} = 15\,V$, $V_{EE} = -15\,V$, $R_C = 5\,k\Omega$, $R_E = 7.5\,k\Omega$. Use the second-approximation method to determine I_T, I_E, V_{C1} and V_{C2}.	5		
4.	a) Design an Op-Amp inverting summer circuit to produce Vo = -(3V1+5V2)	5	4	3
	b) Design an Op-Amp practical integrator with a DC gain of 20 to integrate a square wave of 10 kHz.	5		
5.	Construct six cases of comparator circuits using an Op-Amp, with an input sine-wave of 5V, 3V as reference voltage. Sketch the necessary wave forms.	10	4	3