O.P.Code: 23EC0402 R23 H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. II Year I Semester Regular&Supplementary Examinations November-2025
ELECTRONIC DEVICES AND CIRCUITS

(Electyronics & Communicatiuons Engineering)

Time: 3 Hours

Model.			characteristics.	
b Build the equivalent circuit with the MO	5M	CO2 L2	b Draw the circuit symbol of Tunnel diode. Explain the Volt-Ampere (V-I)	
voltage.			of rectification.	
$K'n = 50 \mu \text{ A/V2}$, Compute the required 1		6 78 II	maximum, average, RMS values of current, DC output voltage, efficiency	
11 a A MOSFET is to operate at ID = 0.1 mA an			resistance is 75Ω while transformer secondary is 10Ω. Calculate	
			step-down ratio of 3:1 to a resistive load of $10k\Omega$. The diode forward	
construction.	5M	CO4 L4	a A Half Wave Rectifier is supplied from a 230V, 50 Hz supply with a	
b Illustrate the MOSFET Transconduct			OR	
expression.			UJT and draw characteristics.	
10 a Define · the MOSFET Transconductance	5M	C02 L2	b With basic structure, symbol and equivalent circuit explain working of	
			reverse bias with neat diagrams and draw VI characteristics.	
b Explain the concept of modeling of Body Ef	SM	CO1 L2	a Illustrate the working of a PN Junction diode under forward bias and CO1 L2	
9 a Plot the V-I Characteristics of an n-channel			UNIT-1	
			(Answer all Five Units $5 \times 10 = 50$ Marks)	
among the JFET parameters μ , rd and gm.			PART-B	
b Discuss the characteristic parameters of the	2M	CO2 L1	j List the applications of the Small-Signal Equivalent Circuits	
Transistor.	2M	CO5 L1	i Define Transconductance.	
8 a Explain the construction & operation of a	2M	CO5 L1	h Draw the CMOS structure.	
	2M	CO2 L1	g State the application of JFET	
o recitity the significance of the base-emitter	2M	CO2 L2	f Name the applications of CC amplifier	
, p	2M	CO3 L1	e What is the trans conductance gm in a BJT?	
T is that the abarost sisting of T and I is	2M	CO2 L2	d Discuss the need of biasing.	
ушины апіршист.	2M	C02 L1	c List the types of BJT and operating regions.	
o Evanate ne sman-signat vonage gain Av	2M	CO2 L1	b List the applications of clampers.	
- 4	2M	CO4 L1	a Define efficiency of a rectifier.	
			. (Answer all the Questions $10 \times 2 = 20 \text{ Marks}$)	
			PART-A	
b Explain Collector to Base bias of a Transist	70	Max. Marks: 70	e: 3 Hours (Enveryments to Communications Digital Max.	O

5		20
Explain Collector to Base bias of a Transistor with neat circuit diagram.	a BJT in CB Configuration.	With neat circuit diagram, explain the Input and Output characteristics of
04		C04
1.2		L3
2		5M

UNIT-III

	b	2
emitter amplifier.	Evaluate the small-signal voltage gain Av, Ri and Ro of a common-	# 2130033 die puipose of sindif-signal analysis in 1511 cilculis.
	CO4 L4 5M	COI
	L 4	14
	5M	COT T7 2MI

OR

d		2		d	20	
b Discuss the characteristic parameters of the JFET and show the relation CO3 L2	Transistor.	a Explain the construction & operation of an enhancement type NMOS CO2 L2	UNIT-IV	b Identify the significance of the base-emitter resistance in the T-model.	a List out the characteristics of CE amplifier with emitter resistance.	
CO3		C02		CO2 L3	C01 L1	
		L2			1.1	
4M		6M		4M	M ₀	

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		NMOS
		C02
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UNIT-V	Explain the concept of modeling of Body Effect.	Plot the V-I Characteristics of an n-channel enhancement MOSFET.
	C02	C02
	CO2 .L2 5M	L2
	5M	5M

expression. Define · the MOSFET Transconductance gm with mathematical · CO5 L1 SM.

construction. Illustrate the MOSFET Transconductance gm with graphical CO5 L3 5M

- $K'n = 50 \mu$ A/V2, Compute the required W/L ratio and the over drive A MOSFET is to operate at ID = 0.1 mA and is to have gm = 1 mA/ V. If CO3 L3 5M
- Model. Build the equivalent circuit with the MOSFET represented by its T-C05 L3 5M

*** END ***

a With neat circuit diagram, explain the Input and Output characteristics of CO4 L2

SM

UNIT-II

Derive the stability factors S, S' and S" of a BJT self-bias.

C04 L2

SM

a BJT in CC Configuration