Course Code: 2030411 **Roll No:** **MLRS- R20**

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
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II B.Tech I Sem Regular End Examination, February-2022

Electronic Devices and Circuits
(ECE)

Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

1.	a)	Draw the basic structure and characteristics of PN junction diode.	2M	CO1	BL-1
	b)	Distinguish between clippers and clampers circuits.	2M	CO1	BL-4
	c)	Define thermal stability.	2M	CO2	BL-5
	d)	Write any four differences between CB and CC Configurations.	2M	CO2	BL-1
	e)	Draw the basic structure of FET and name different layers.	2M	CO3	BL-4
	f)	Define Pinch-Off Voltage and mention its expression.	2M	CO3	BL-1
	g)	List the Typical values of h- parameters in CB configuration.	2M	CO4	BL-4
	h)	What are the typical values of h- parameters in CE Configuration?	2M	CO4	BL-1
	i)	Brief the operation of the Zener diode.	2M	CO5	BL-4
	j)	Compare FET amplifier and BJT amplifier.	2M	CO5	BL-2

PART- B

(10*5 Marks = 50 Marks)

2	a)	Explain PN diode characteristics in forward bias and reverse bias regions.	5M	CO1	BL-5
	b)	Compare the different parameters of half ware, full-wave, and bridge rectifier with diagrams.	5M	CO1	BL-2

OR

3		List different part of V-I characteristics of a diode and also draw V-I characteristics of a PN diode for the following conditions: i) $R_f = 0, V_\gamma = 0, R_r = \infty$ ii) $R_f = 0, V_\gamma = 0.6V, R_r = \infty$ iii) R_f = Non-zero, fixed value, $V_\gamma = 0, R_r = \infty$ iv) R_f = Non-zero, fixed value, $V_\gamma = 0.6V, R_r = \infty$ Where V_γ is the cut-in voltage, R_f is the forward dynamic resistance & R_r is the reverse dynamic resistance of the diode.	10M	CO1	BL-4

4	a)	Draw the circuit diagram of NPN transistor in the Common Collector configuration, and describe its static input-output characteristics with neat sketches and necessary equations	5M	CO2	BL-2
	b)	Explain the different methods of Stabilization of operating point with a transistor.	5M	CO2	BL-5
		OR			
5		Define the Early-effect, justify why it is called base-width modulation, and discuss its consequences in transistors in detail?	10M	CO2	BL-4
6	a)	Define biasing and explain different methods of FET biasing.	5M	CO3	BL-2
	b)	Describe the fundamental difference between FET and MOSFET, and explain the operation of MOSFET operation.	5M	CO3	BL-2
		OR			
7		Differentiate and explain MOSFET Characteristics in Enhancement and Depletion mode with diagrams.	10M	CO3	BL-3
8	a)	Compare CB, CE, and CC amplifiers in terms of A_V, A_I, R_i and R_O	5M	CO4	BL-2
	b)	Explain the effect of coupling and bypass capacitors on CE Amplifier with required circuit diagrams and equations.	5M	CO4	BL-5
		OR			
9		Analyze the small-signal equivalent circuit of Emitter Follower using the accurate h-parameter model. For the emitter follower circuit with R_S = 0.5 K and R_L = 5K, Compute R_i, A_V, and R_O. Assume, h_{fe} = 50, h_{re} =1K, hoe = 25 μA/V.	10M	CO4	BL-5
10	a)	Explain the construction and operation of SCR and list its applications.	5M	CO5	BL-5
	b)	Discuss the characteristics, operation, and applications of Photodiode and Solar Cell.	5M	CO5	BL-6
		OR			
11		Compare CS, CD, and configurations of JFET Amplifiers with required circuit diagrams and different parameters.	10M	CO5	BL-5

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