Question Paper Code: R22A12EC01

R22

ANURAG Engineering College

(An Autonomous Institution)

I B.Tech II Semester Supplementary Examinations, January - 2025

ELECTRONIC DEVICES AND CIRCUITS

(COMMON TO ECE, CSE, IT AND AI&ML)

Time: 3 Hours **Max. Marks: 60**

Section – A (Short Answer type questions) (10 Marks)

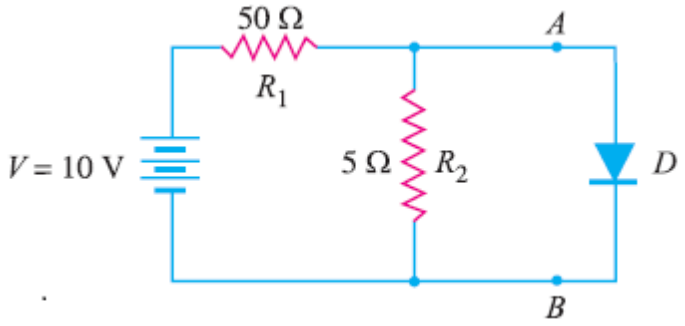
Answer All Questions

		Course Outcome	B.T Level	Marks
1.	Define diffusion capacitance of P-N diode.	CO1	L1	1M
2.	Write applications of Diode.	CO1	L1	1M
3.	Give the advantages of bridge rectifier.	CO2	L1	1M
4.	Define a clipper circuit.	CO2	L1	1M
5.	Which of the BJT configurations are suitable for impedance matching applications, Why?	CO3	L2	1M
6.	Draw the circuit symbols for PNP and NPN transistors.	CO3	L2	1M
7.	Why we call FET as a voltage-controlled device?	CO4	L2	1M
8.	Compare BJT and FET.	CO4	L1	1M
9.	Zener diode can be used as a voltage regulator. Justify it.	CO5	L2	1M
10.	Draw V-I characteristics of schottky diode.	CO5	L1	1M

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A)	Find the current through the diode in the circuit shown in Figure. Assume the diode to be ideal.	CO1	L3	10M



OR

B)	Draw and explain V-I characteristics of PN junction diode and also calculate the value of new temperature if the new reverse saturation current is observed to be 160 nA for a P-N junction silicon diode which has a reverse saturation current of 50nA at room temperature 270K.	CO1	L3	10M
12. A)	Explain in detail about Full wave rectifier and derive its ripple factor and efficiency.	CO2	L3	10M

OR

B)	i) In half-wave rectifier an ac voltage of peak value 24V is connected in series with silicon diode and load resistance of 480Ω. If the forward resistance of the diode is 20Ω, find average load current and rms value of load current.	CO2	L3	5M
	ii) Compare half wave, full wave and bridge rectifier circuits.			5M

13.	A)	Derive the relation between alpha, beta and gamma.	CO3	L3	10M
		OR			
	B)	Define the following switching times of transistor: Rise time, fall time, Storage time, Turn off tine and Delay time.	CO3	L3	10M
14.	A)	Explain the constructional features of a depletion mode P-channel MOSFET and explain its basic operation.	CO4	L3	10M
		OR			
	B)	Analyze the Static characteristics of JFET.	CO4	L3	10M
15.	A)	Define varactor diode? Explain the operation of varactor diode with its equivalent circuit and mention its applications.	CO5	L3	10M
		OR			
	B)	Explain Zener breakdown and V-I characteristics of ZENER diode.	CO5	L3	10M