Question Paper Code: R15A12EC01

R15

ANURAG Engineering College

(An Autonomous Institution)

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

ELECTRONIC DEVICES AND CIRCUITS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max. Marks: 75**

Section – A (Short Answer type questions) (25 Marks)

Answer All Questions

		Course Outcome	B.T Level	Marks
1.	Define diffusion capacitance and transition capacitance in a diode	CO1	L1	2M
2.	Define Half Wave Rectifier. Draw the circuit diagram of halfwave rectifier.	CO1	L2	3M
3.	Write relationship between α, β and γ?	CO2	L2	2M
4.	Define the pinch-off voltage in a JFET	CO2	L1	3M
5.	Draw the fixed bias and the self-bias circuits	CO3	L2	2M
6.	What is the condition for thermal stability?	CO3	L1	3M
7.	Write Advantages of h-parameter model.	CO4	L1	2M
8.	Draw the h- parameter model of BJT in common emitter configuration.	CO4	L2	3M
9.	What are the advantages of introducing negative feedback?	CO5	L1	2M
10.	State the Barkhausen criterion for an oscillator	CO5	L2	3M

Section B (Essay Questions)

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

11. A)	Draw and Explain Centre tapped Full wave rectifier with neat circuit diagrams. Derive Expressions for ripple factor, PIV, Efficiency.	CO1	L2	10M
	OR			
B)	What is tunnelling phenomena? Explain the principle of operation of tunnel diode with its characteristics.	CO1	L3	10M
12. A)	Explain the construction and operation of JFET and draw its characteristics. Derive the relationship among transconductance, drain resistance and Amplification factor of a JFET.	CO2	L3	10M
	OR			
B)	Draw and explain the input and output characteristics of BJT in common base configuration. Derive the relationship between α,β,γ.	CO2	L2	10M
13. A)	Draw a voltage divider bias BJT network. Derive expressions for ICQ and VCEQ and describe the method of drawing the dc load line on the output characteristics of transistor.	CO3	L3	10M
	OR			
B)	A silicon transistor with β = 49 is used in self bias arrangement with VCC = 5V, RE = 1Kohms and IE = 1mA. Find the values of R1 and R2 such that the stability factor does not exceed 5.	CO3	L3	10M

14. A)	The CE amplifier has the following specifications. hie=1100 ohms, hre=2.5X10-4 , hfe=50, hoe=24μA/V if RL=10Kohms and Rs=1k ohm. Find the various gains and input impedances and output impedances.	CO4	L3	10M
	OR			
B)	Draw the circuit diagram of common source amplifier and derive expression for voltage gain, current gain, input impedance and output admittance.	CO4	L2	10M
15. A)	Explain working principle of Colpitts oscillator. Derive the Expression for frequency of oscillations.	CO5	L2	10M
	OR			
B)	What is feedback. What is the effect of feedback on amplifiers? Classify different types of negative feedback amplifiers.	CO5	L2	10M