

**ANURAG Engineering College**

(An Autonomous Institution)

I B.Tech. II Semester Supplementary Examinations, June/July – 2024

**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 ripple factor and PIV.	CO1	L1	2M
2. Define drift and diffusion currents of a semiconductor.	CO1	L1	3M
3. Define trans-conductance $g_m$ and drain resistance of a FET	CO2	L1	2M
4. Explain the base width modulation.	CO2	L2	3M
5. Explain the term Thermal runaway.	CO3	L1	2M
6. What are the essential conditions for biasing of a Transistor?	CO3	L2	3M
7. Draw the hybrid equivalent circuit for any one configuration	CO4	L2	2M
8. Write differences between FET and BJT.	CO4	L1	3M
9. What is Barkhausen criterion?	CO5	L1	2M
10. Classify different sinusoidal oscillators.	CO5	L2	3M

**Section B (Essay Questions)**

Answer all questions, each question carries equal marks.

(5 X 10M = 50M)

11. A) Explain the operation of PN junction diode in forward and reverse bias regions. Draw the V-I characteristics of diode.	CO1	L3	10M
<b>OR</b>			
B) Draw the circuit diagram and explain the operation of full wave rectifier using centre tap transformer and using bridge rectifier without centre tap transformer. Obtain the expression for peak inverse voltages of both.	CO1	L3	10M
12. A) Draw the circuit diagram of an NPN junction transistor in CE configuration and describe its characteristics.	CO2	L2	10M
<b>OR</b>			
B) Explain the working of a depletion type MOSFET with a neat construction diagram and its characteristics.	CO2	L2	10M
13. A) What is biasing? Explain the need of it. List out different types of biasing methods.	CO3	L2	10M
<b>OR</b>			
B) i) An npn transistor if $\beta=50$ is used in CE circuit with $V_{cc} = 10V$ , $R_c = 2K\Omega$ . The bias is obtained by connecting $100k\Omega$ resistor from collector to base. Find the quiescent point and stability factor. ii) Explain the concept of thermal runaway in detail.	CO3	L3	6M
		L2	4M
14. A) Draw the small signal low frequency h- parameter model of CE, CB, and CC configurations and compare voltage gain, current gain, input impedance, output impedance.	CO4	L3	10M
<b>OR</b>			
B) Explain the operation of UJT. Draw the characteristics and explain?	CO4	L2	10M

15. A) Explain RC phase shift oscillator. Derive the expression for frequency of oscillations. CO5 L2 10M

**OR**

B) An amplifier has voltage gain with feedback of 100. If the gain without feedback changes by 20% and the gain with feedback should not vary more than 2%, determine the values of open loop gain A and feedback ratio  $\beta$ . CO5 L3 10M