



R22 Regulation

Subject code: 4E3EA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Supplementary Examinations, July 2024

Semiconductor Devices and Circuits

(Common to CSE, CSE(AI&ML) & CSE(DS))

Maximum Marks: 60

Date: 20.07.2024 Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A		CO	Bloom Tx
All the following questions carry equal marks (10X1M=10 Marks)			
1.a)	Write down the Diode current equation and mention its parameters	1	L1
b)	Draw the equivalent circuit of PN junction diode	1	L2
c)	What are applications of Varactor diode?	2	L1
d)	Define avalanche breakdown ?	2	L1
e)	Define Peak Inverse Voltage.	3	L1
f)	What is TUF?	3	L2
g)	Define the amplification factor for CB transistor	4	L1
h)	What are transistor biasing techniques?	4	L2
i)	Define Pinch-off Voltage	5	L1
j)	Draw the symbols of D-MOSFET and E-MOSFET.	5	L2
Part-B			Bloom Tx level
Answer All the following questions. (5X10M=50Marks)			
2	a) Derive the equation for Diffusion Capacitance. [5M] b) Discuss about static and dynamic resistances. [5M]	1	L3 L3
OR			
3	Draw the circuit diagram of forward bias and Reverse bias PN junction diode and explain its operation. [10M]	1	L2
4	Describe the construction and working of SCR with its equivalent circuit and V-I Characteristics. [10M]	2	L3
OR			
5	How does the Zener diode act as voltage regulator? Explain. [10M]	2	L2
6	Explain the working of a full wave rectifier with necessary waveforms. [10M]	3	L2
OR			
7	Derive the expressions for ripple factor, efficiency and transformer utilization factor of Half wave rectifier. [10M]	3	L3

8	Draw the construction of BJT and explain the operation of NPN transistor. [10M]	4	L2
	OR		
9	Explain the DC Load line analysis using operating point. [10M]	4	L2
10	Draw the circuit diagram of N- Channel JFET and explain its operation. [10M]	5	L2
	OR		
11	Compare BJT,FET and MOSFET. [10M]	5	L2