



R22 Regulation

Subject code: 4E3EA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Regular Examinations, February 2024

Semiconductor Devices and Circuits

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

Maximum Marks: 60

Date: 19.02.2024 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)	Define an intrinsic semiconductor.	CO1	L1
b)	Define a term conductivity in a semiconductors.	CO1	L1
c)	What is tunneling?	CO2	L1
d)	List the breakdown mechanism.	CO2	L1
e)	What is meant by rectifier?	CO3	L1
f)	What is the use of filters in rectifier circuits?	CO3	L1
g)	Draw the basic transistor biasing circuit in CB configuration.	CO4	L1
h)	Draw the symbols of NPN and PNP transistors	CO4	L1
i)	Expand E-MOSFET.	CO5	L1
j)	What is the difference between FET and BJT?	CO5	L1
Part-B			
Answer All the following questions. (5X10M=50Marks)			
2	a) Draw the circuit diagram of forward bias and Reverse bias of PN junction diode and explain its operation b) Derive the expression for Transition Capacitance	5M 5M	CO1 L3 L3
OR			
3	a) What is the effect of temperature on PN junction diode. b) Draw and explain V-I characteristics of PN diode?	5M 5M	CO1 L3 L3
4	Describe the construction and working of Zener diode with V-I Characteristics.	10M	CO2 L3
OR			
5	Explain the working principle of Tunnel diode and explain V-I characteristics.	10M	CO2 L2
6	Explain the following parameters of FWR. a) V _{dc} b) V _{rms} c) Ripple factor d) Efficiency e) PIV	5X2M	CO3 L2
OR			
7	What is the need of Bridge Rectifier? Explain its operation with neat diagram.	10M	CO3 L2

8	Draw the circuit diagram of an NPN & PNP transistor and explain its operation.	10M	CO4	L2
	OR			
9	Explain input and output characteristics of a transistor in CB configurations with neat sketches.	10M	CO4	L2
10	Illustrate the construction and principle of operation of JFET with necessary diagrams.	10M	CO5	L3
	OR			
11	Explain the drain and transfer characteristics of Enhancement type MOSFET.	10M	CO5	L2