



R22 Regulation

Subject code:4E2AJ

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Supplementary Examinations, January 2026

ELECTRONIC DEVICES AND CIRCUITS

(Common to ECE & IT)

Maximum Marks: 60

Date: 24.01.2026

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 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

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BTL
1.a	What is meant by doping in semiconductor?	1M	1	L1
b	Define static and dynamic resistances.	1M	1	L2
c	What is ripple factor?	1M	2	L1
d	Write down the ripple factor equation for Capacitor filter.	1M	2	L1
e	Draw the CE transistor configuration diagram.	1M	3	L2
f	Define active region in BJT transistor.	1M	3	L2
g	What is bias compensation?	1M	4	L1
h	What is difference between DC load line and AC load line?	1M	4	L1
i	Define transconductance.	1M	5	L1
j	Draw the symbols of E-MOSFET.	1M	5	L2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	Explain the V-I characteristics of PN junction diode in forward and reverse bias conditions.	10M	1	L2
OR				
3	Explain the Zener diode which operates in breakdown region with adequate power dissipation and describe its V-I characteristics.	10M	1	L3
4	Derive the following parameters for full wave rectifier and determine ripple factor? i) V_{dc} , ii) I_{dc} iii) V_{rms} iv) I_{rms}	10M	2	L4
OR				
5	A half wave rectifier, having a resistance load of $1K\Omega$, rectifies an alternating voltage of 325V peak value and the diode has a forward resistance of 100Ω . Calculate a) Peak, average and RMS value of current b) DC power output c) AC input power d) Efficiency of the rectifier.	10M	2	L3
6	Explain the operations of NPN and PNP transistors?	10M	3	L2
OR				

7	Explain the input and output characteristics of CC transistor configuration with neat sketch.	10M	3	L2
8	Draw the collector to base bias circuit diagram and derive an expression for stability factor.	10M	4	L2
	OR			
9	a) Discuss bias compensation using diodes. b) How to establish a Q point on the center of the DC load line?	5M 5M	4	L3
10	Draw the D-MOSFET diagram and discuss it using drain characteristics.	10M	5	L2
	OR			
11	Draw the P-Channel JFET diagram , explain its V-I characteristics	10M	5	L2