R22 Regulation *Subject code: 4E2AJ*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Regular Examinations, September 2023

ELECTRONIC DEVCES & CIRCUITS

(Common to ECE & IT)

Maximum Marks: 60 Date:25.09.2023 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

All the following questions carry equal marks (10x1M=10 Marks)

1. a Define Doping.
   b Define diffusion and drift current.
   c Define Rectifier.
   d What is the need for Filter?
   e What is early effect?
   f What is the function of transistor?
   g What is the need for transistor biasing?
   h What is need for stabilization in a transistor?
   i List the advantages of FET over BJT.
   j Define the pinch off voltage (Vp).

Part-B

Answer All the following questions. (5X10M=50Marks)

2 Draw and explain forward and reverse bias characteristics of P-N junction diode. [10]

OR

3 Draw and explain V-I characteristics of Zener diode with neat diagrams. [10]

4 Explain the operation of a Full wave Rectifier. Derive its ripple factor and Efficiency. [10]

OR

5 Define the following terms and derive the equations with respect to half-wave rectifier:
(i) Ripple factor (ii) Peak inverse voltage (iii) Rectification efficiency (iv) % Regulation. [10]

6 Explain the input and output characteristics of CB configuration with neat diagrams. [10]

OR

7 Explain the input and output characteristics of a transistor in CE configuration. [10]

8 Draw and explain the operation of Self-bias circuit and derive its Stability factor?

OR

9 a) Explain DC load line analysis of a transistor. [5]

b) An NPN transistor with $\beta = 50$ is used in common Emitter configuration with $V_{CC} = 10V$ and $R_C = 2.2\ K\Omega$. Biasing is done through a 100 $K\Omega$ resistance from collector – to – Base. Assuming V_{BE} to be zero volts, Find (i) The quiescent point (ii) The stability factor. [5]

10 Explain the working of MOSFET in (i) Enhancement mode (ii) Depletion mode. [10]

OR

11 With the help of neat circuit diagram explain the operation of N-channel JFET and explain Drain & Transfer characteristics of JFET. [10]