R18 Regulation

Subject code: 2E1AH

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech I Semester Supplementary Examinations, March/April 2023

Electronic Devices and Circuits

(Common to ECE & CSE)

Maximum Marks: 70 Date:12.04.2023 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 (10x2M=20 Marks)

1 Define Passive and Active components.
2 What is the function of Diode?
3 Draw the symbol of varactor diode.
4 Write the applications of Zener diode?
5 Define rectifier.
6 Write the filter function in rectifiers.
7 When does a transistor act as a switch?
8 Define saturation region.
9 Why FET is called a voltage operated device.
10 Define pinch off voltage.

Part-B

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

11 A. Distinguish between drift and diffusion current in a semiconductor. [5M]
B. Explain the temperature dependence of VI characteristics of P-N diode? [5M]

OR

12 A. Distinguish between Static and dynamic resistances of a P-N diode. [5M]
B. Derive an expression for total diode current starting from Boltzmann relationship in terms of the applied voltage? [5M]

13 Explain SCR operation with it's characteristics. [10M]

OR

14 Explain Zener and avalanche breakdown mechanisms in detail? [10M]

15 Explain Half-wave-rectifier with neat waveform and derive the efficiency. [10M]

OR

16 Explain the necessity of a bleeder resistor in an L-section filter used with an FWR? [10M]

17 Draw the input and output characteristics of a transistor in CE configurations? [10M]

OR

18 Determine the significance of operating point, DC and AC load lines to ensure active region operation of a BJT in CE amplifier application? [10M]

19 With the help of neat sketches and characteristic curves explain the construction & operation of a JFET and mark the regions of operation on the characteristics? [10M]

OR

20 Explain the construction & operation of a P-channel MOSFET in enhancement and depletion modes with the help of static drain characteristics and transfer characteristics? [10M]