Question Paper Code: R22A12EC01

R22

# ANURAG Engineering College

## (An Autonomous Institution)

## I B.Tech II Semester Supplementary Examinations, Jan/Feb-2024

## ELECTRONIC DEVICES AND CIRCUITS

## (COMMON TO ECE, CSE, IT & AI&ML)

**Time: 3 Hours** **Max. Marks: 60**

### Section – A (Short Answer type questions) (10 Marks)

| Answer All Questions | | Course Outcome | B.T Level | Marks |
|---|---|---|---|---|
| 1. | Define Reverse Saturation Current in PN Junction Diode. | CO1 | L1 | 1M |
| 2. | Draw the equivalent circuits of PN diode. | CO1 | L2 | 1M |
| 3. | What is ripple factor? And mention typical value for Half Wave Rectifier. | CO2 | L1 | 1M |
| 4. | State Clamping Circuit Theorem. | CO2 | L1 | 1M |
| 5. | Explain the operation of BJT. | CO3 | L2 | 1M |
| 6. | Give the relation between $\alpha$, $\beta$, and $\gamma$ | CO3 | L2 | 1M |
| 7. | Write the differences between JFET and BJT. | CO4 | L2 | 1M |
| 8. | Why we call FET as a Voltage Controlled Device? | CO4 | L1 | 1M |
| 9. | What are the applications of UJT? | CO5 | L2 | 1M |
| 10. | What is tunnelling? | CO5 | L1 | 1M |

### Section B (Essay Questions)

**Answer all questions, each question carries equal marks.** **(5 X 10M = 50M)**

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|---|---|---|---|---|
| 11. A) | Derive the expression for transition capacitance of a P-N junction Diode. | CO1 | L3 | 10M |
| | **OR** | | | |
| B) | How a diode is used as switch and defines all switching times. | CO1 | L3 | 10M |
| 12. A) | Draw and explain Bridge Rectifier with the help of wave forms and derive the following parameters. i) $V_{DC}$ ii) Efficiency iii) Ripple Factor iv) TUF . | CO2 | L3 | 10M |
| | **OR** | | | |
| B) | Explain the operation of positive clamping and negative clamping circuits. | CO2 | L3 | 10M |
| 13. A) | Draw and explain the input and output characteristics of BJT for CB configuration. | CO3 | L3 | 10M |
| | **OR** | | | |
| B) | i). A transistor has a typical $\beta$ of 100. If the collector current is 40mA, what is the value of emitter current? | CO3 | L3 | 5M |
| | ii). Explain the working of the transistor as a switch. | CO3 | | 5M |
| 14. A) | Explain the construction, principle of operation and Volt-Ampere characteristics of JFET. | CO4 | L3 | 10M |
| | **OR** | | | |
| B) | Explain with the help of neat diagrams, the structure and working principles of a N-channel enhancement mode MOSFET. | CO4 | L3 | 10M |
| 15. A) | Draw the circuit diagram of SCR and explain its operation along with its characteristics. | CO5 | L3 | 10M |
| | **OR** | | | |
| B) | Explain V-I characteristics of Zener diode with neat diagram. | CO5 | L3 | 10M |