

Roll No.

Total No. of Pages : 02

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B.Tech. (CSE/EE/IT/ME) (Sem-7)

ELECTRONIC DEVICES

Subject Code : BTEC-301-18

M.Code : 90606

Date of Examination : 10-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a) Describe the behaviour of p-n junction diode under forward and reverse biased conditions.
- b) Give the Energy band diagrams of Intrinsic and Extrinsic Semiconductors
- c) Differentiate between Drift current and Diffusion current in a semiconductor.
- d) What do you understand by: i) Knee voltage and ii) Breakdown voltage?
- e) What is Ebers - Moll model in Transistors?
- f) Mention any two advantages of MOSFET over JFET.
- g) What is the purpose of Sputtering in Fabrication process of ICs or devices?
- h) Give the circuit symbols for Zener diode, Tunnel diode, Varactor diode and a Transistor.
- i) Derive the relation between α and β with respect to BJT.
- j) What is the significance of etching?

SECTION-B

2. Draw Ebers-Moll model and hence explain Transistor action.
3. Explain the construction and working of a MOSFET. Give its V – I characteristics.
4. What are the three important configurations in which the transistor can be connected? Discuss any one of them.
5. **Define :**
Diffusion and Ion-Implantation. What are the various types of Ion-implantation techniques that are commonly used in fab line?
6. What do you mean by oxidation process? Explain in detail. Also give characteristics of different oxide films.

SECTION-C

7. Draw and explain Half-wave and full - wave (centre - tapped & bridge) rectifiers 10 with suitable circuit diagrams. Which one is preferable and why?
8. In a CE configuration, the collector supply voltage is 10V. When a resistor $R_C=1K\Omega$ is connected in the collector circuit, the voltage drop across it is 0.5 V. For $\alpha=0.98$, determine the collector-emitter voltage and the base current.
9. How doping done using ion implantation? Draw and explain the working of ion implanter.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.