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Total No. of Questions : 09

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 RC=1KΩ is connected in the collector circuit, the voltage drop across it is 0.5 V. For α=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.