Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (ECE) (Sem.–3)

ELECTRONIC DEVICES

Subject Code : UC-BTEC-301-19

M.Code : 78746

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

Write briefly :

1) How can you classify solids on the basis of conductivity? Give examples also.

2) Give the Energy band diagrams of Intrinsic and Extrinsic Semiconductors.

3) Differentiate between Drift current and Diffusion current in a semiconductor.

4) What do you understand by :

   i) Depletion region and

   ii) Potential barrier - in a semiconductor.

5) What is Ebers-Moll model in Transistors?

6) Define MOSFET. Give its types.

7) What is the purpose of Sputtering in Fabrication process of ICs or devices?

8) Give the circuit symbols for Zener diode, Tunnel diode, Varactor diode and a Transistor. Label them properly.

9) Draw the Input and Output V-I characteristics of a bipolar junction transistor. Label the characteristics wherever required.

10) What is the significance of Etching in fabrication processes of Electronics devices? Name some commonly used etchants.

SECTION-B

11) Discuss the behavior of pn-junction diode when forward biased as well as reverse biased giving suitable neat diagrams.

12) Explain the construction and working of a MOSFET. Give its V-I characteristics.

13) What are the three important configurations in which the transistor can be connected? Discuss any one of them.

14) Define: Diffusion and Ion-Implantation. What are the various types of Ion-implantation techniques that are commonly used in fab line?

15) A full-wave rectifier uses two diodes, the internal resistance of each diode may be assumed constant at 20Ω. The transformer r.m.s. secondary voltage from centre tap to each end of secondary is 50V and load resistance is 980V. Find:

    i) The mean load current (Idc)

    ii) The r.m.s. value of load current

SECTION-C

16) Draw and explain Half-wave and full-wave (center-tapped & bridge) rectifiers with suitable circuit diagrams. Which one is more preferable and why?

17) Write short notes on :

    i) Light Emitting Diode (LED)

    ii) Schottky Diode.

18) List and explain the various important fabrication processes used for the fabrication of BJTs/MOSFETs.

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.