

USN

--	--	--	--	--	--	--	--	--	--

18EC33

Third Semester B.E. Degree Examination, July/August 2021 Electronic Devices

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1
 - a. What are the different types of Bonding Forces in solids and explain any one. (06 Marks)
 - b. Draw the typical band structures at OK for insulator, semiconductor and metal and explain it. (06 Marks)
 - c. With mathematical equations, describe the hall effect. (08 Marks)
- 2
 - a. Explain Electron-hole pair in a semiconductor with the help of the graph. (06 Marks)
 - b. Explain the effects of temperature and doping on mobility. (06 Marks)
 - c. Describe the drift of electrons and holes in a semiconductor bar. (08 Marks)
- 3
 - a. Draw the I-V characteristic of a Pn-junction with current equation under equilibrium, forward and reverse bias and explain it. (06 Marks)
 - b. Explain the concept of Zener breakdown with energy band diagram. (06 Marks)
 - c. Explain the solar cells with structures. (08 Marks)
- 4
 - a. Draw the piece wise linear approximations of junction diode characteristics for ideal diode, ideal diode with offset voltage and ideal diode with offset voltage and resistance. (06 Marks)
 - b. Draw the schematic representation of a P-i-n photodiode and explain it. (06 Marks)
 - c. Explain the Avalanche Breakdown with energy diagram. (08 Marks)
- 5
 - a. Explain the working of P-n-P device and also draw the curve of I_C versus V_{BC} . (06 Marks)
 - b. Describe the various mechanisms of a switching cycle of a PnP transistor. (06 Marks)
 - c. Write the step-by-step fabrication of a BJT with diagrams. (08 Marks)
- 6
 - a. Define the following parameters:
 - i) Emitter injection efficiency
 - ii) Current transfer ratio
 - iii) Base to collector current amplification factor. (06 Marks)
 - b. Draw the simple switching circuit of PnP transistor and explain it. (06 Marks)
 - c. Discuss Base Narrowing in PnP transistor. (08 Marks)
- 7
 - a. Explain the operation of a basic Pn JFET for different gate voltage. (10 Marks)
 - b. Draw the small signal equivalent circuit of JFET and explain it. (10 Marks)
- 8
 - a. Draw the energy band diagram of an two terminal MOS capacitor with a P-type substrate for a negative gate bias and a moderate positive gate bias and explain it. (10 Marks)
 - b. Explain the structure of n-channel enhancement mode and depletion mode MOSFET. (10 Marks)
- 9
 - a. Describe the Rapid thermal processing with the help of diagram. (10 Marks)
 - b. Explain the method of ION implementation with schematic diagram. (10 Marks)
- 10
 - a. What are the types of integrated circuits and explain it. (06 Marks)
 - b. Mention the Advantages of Integration. (06 Marks)
 - c. With input and output waveforms, explain the working of CMOS inverter. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.