



**Third Semester B.E. Degree Examination, Dec.2024/Jan.2025**  
**Electronic Devices**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

**Module-1**

- 1 a. Illustrate the different types of bonding forces in solids with neat diagram. (10 Marks)
- b. Differentiate between Direct and Indirect semiconductor. (10 Marks)

**OR**

- 2 a. Explain Electron – Hole pair concept with the help of neat diagram and equations. (10 Marks)
- b. What is Hall – Effect? With neat diagram, explain how does hall effect works. (10 Marks)

**Module-2**

- 3 a. Explain the qualitative description of current flow at P-N junction under equilibrium and biased condition. (10 Marks)
- b. Explain Zener breakdown and avalanche breakdown under reverse biased P-N junction with neat diagram. (10 Marks)

**OR**

- 4 a. Discuss the operation of light emitting diode with neat sketch. (10 Marks)
- b. How does photodiode works as a photovoltaic cell explain with the help of diagram? (10 Marks)

**Module-3**

- 5 a. Explain the amplification of a p-n-p transistor with neat diagram. (10 Marks)
- b. Explain the switching operation of a transistor. Also explain the four operating regimes of transistors. (10 Marks)

**OR**

- 6 a. Derive an expression for  $I_c$  and  $I_E$  using Ebers Moll equation and draw its equivalent circuit. (10 Marks)
- b. Discuss the fabrication process of BJT. (10 Marks)

**Module-4**

- 7 a. Discuss the Basic n channel pn JFET operation with equivalent circuit and frequency limitation. (10 Marks)
- b. Explain Ideal capacitance – voltage characteristics of MOSFET. (10 Marks)

**OR**

- 8 a. Explain two – terminal MOS structure using energy band diagram. (10 Marks)
- b. Explain the principle of operation of p-channel enhancement mode MOSFET with neat diagram and equations. (10 Marks)

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**Module-5**

- 9 a. With Schematic diagram, explain ION – implantation system. (08 Marks)
- b. Explain low pressure chemical vapour deposition reactor. (06 Marks)
- c. Discuss photolithography neat sketch. (06 Marks)

**OR**

- 10 a. What are the different types of Integrated circuits and its significance? (10 Marks)
- b. Explain the process of Integration involved in CMOS technology. (10 Marks)

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