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**B.TECH.**  
**(SEM V) THEORY EXAMINATION 2022-23**  
**ADVANCE SEMICONDUCTOR DEVICE**

**Time: 3 Hours****Total Marks: 100****Note:** Attempt all Sections. If you require any missing data, then choose suitably.**SECTION A****1. Attempt all questions in brief. 2x10 = 20**

- (a) Define the term crystal structure.
- (b) Describe the term insulators.
- (c) Explain the term bipolar in BJTs.
- (d) What is a non-volatile memory device?
- (e) What is the term noise in circuits?
- (f) Explain the term V-I Characteristics in any circuit.
- (g) What is defined as power devices?
- (h) Elaborate the term Radioactive.
- (i) Describe the term photoconductor.
- (j) Define the term sensors.

**SECTION B****2. Attempt any three of the following: 10x3 = 30**

- (a) Explain the term Energy band. Compare conductors, semiconductors, and insulators on the basis of energy band and energy gap.
- (b) Illustrate the term scaling and describe the associated short-channel effects in FETs.
- (c) Describe the V-I characteristics and working of the Tunnel diode.
- (d) Elaborate the working circuit and V-I characteristics of the Light-Emitting-Diode (LED).
- (e) Describe with a block diagram the architecture of FPGA.

**SECTION C****3. Attempt any one part of the following: 10x1 = 10**

- (a) Explain the V-I characteristics and working of Metal-Semiconductor Devices.
- (b) Describe the V-I characteristics and working of the Varactor diode.

**4. Attempt any one part of the following: 10 x1 = 10**

- (a) Elaborate the working and applications of heterojunction Bipolar transistors.
- (b) Illustrate the working, V-I characteristics, and applications of JFETs.

**5. Attempt any one part of the following: 10x1 = 10**

- (a) Describe the working and applications of BARITT Diode.
- (b) Explain the working and applications of TUNNETT Diode.

**6. Attempt any one part of the following: 10x1 = 10**

- (a) Elaborate the working and applications of thyristors.
- (b) Illustrate the working, V-I characteristics, and applications of LASER diodes.

**7. Attempt any one part of the following: 10x1 = 10**

- (a) Describe the working and applications of Charged-Coupled-Devices (CCDs).
- (b) Explain the working and applications of Mechanical Sensors.