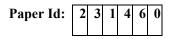
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# Roll No.

### **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. Attemptall questions in brief.

- Define the term crystal structure. (a)
- (b) Describe he term insulators.
- (c) Explain the term bipolar in BJTs.
- (d) What is a non-volatile memory device?
- What is the term noise in circuits? (e)
- Explain the term V-I Characteristics in any circuit. (f)
- (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:

- (a) Explainthe 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.
- Elaboratethe working circuit and V-I characteristics of the Light-Emitting-Diode (d) (LED).
- Describewith a block diagram the architecture of FPGA. (e)

### SECTION C

### 3. Attempt any one part of the following:

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

### 4. Attempt any one part of the following:

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

### 5. Attempt any one part of the following:

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

#### Attempt any one part of the following: 6.

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

#### 7. Attempt any one part of the following:

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

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