

**328315(28)**

**B. E. (Third Semester) Examination, 2020  
(Old Scheme)**

**(Et&T Engg. Branch)**

**SOLID STATE DEVICES and COMPONENTS**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note:*** All units are compulsory and carry equal marks. Part (a) is compulsory of each unit and solve any two parts from (b), (c) & (d) of each question. Part (a) carry 2 marks and Part (b), (c) & (d) carry 7 marks.

**Unit-I**

1. (a) What do you mean by Extrinsic semiconductor? 2
- (b) Explain the formation of Extrinsic conductors. 7

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- (c) Derive continuity equation. 7
- (d) Explain potential variation in graded semiconductor. 7

**Unit-II**

- 2. (a) Mention the assumptions made in Clausius-Mossotti equation. 2
- (b) Explain the properties of Ferro-electric materials. 7
- (c) Explain dielectric losses. 7
- (d) Explain the effect of frequency on polarization. 7

**Unit-III**

- 3. (a) State the names of different magnetic materials. 2
- (b) Give the summary of concepts pertaining to magnetic fields. 7
- (c) Classify magnetic materials. 7
- (d) Compare ferrormagnetic materials with ferroelectric materials. 7

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**Unit-IV**

- 4. (a) Define Ohm's law. 2
- (b) Explain relaxation time, collision time and mean free path. 7
- (c) Explain heat developed in current carrying conductor. 7
- (d) Define current density and conductance. 7

**Unit-V**

- 5. (a) What do you mean by active and passive components? 2
- (b) Explain the characteristics of Resistor. 7
- (c) Explain the characteristics of different capacitors and their selection factors. 7
- (d) Explain the characteristics of electronics power transformer and audio transformer. 7