

No. of Printed Pages : 03

Roll No. ....

**W-112**

**B. Tech. (Weekend) EXAMINATION,**

**Dec. 2017**

(First Semester)

(Re-appear Only)

ELECTRICAL ENGINEERING MATERIALS  
AND SEMICONDUCTOR DEVICES

ECE(W)-101

(Common for All Branches)

*Time : 3 Hours]*

*[Maximum Marks : 100*

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Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

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**Note :** Attempt any *Five* questions. All questions carry equal marks.

(2-63/9) M-W-112

**P.T.O.**

1. (a) Define the terms relaxation time and collision time. Also, discuss the types of thermal conductivity and effect of magnetic field. **10**  
 (b) Explain the role and importance of superconductivity and energy bands. **10**
2. (a) Briefly discuss types of dielectric and insulating materials. **10**  
 (b) What do you understand by the terms dielectric loss, electrostriction and loss tangent ? Also discuss the mechanism of polarization. **10**
3. (a) Differentiate between magnetic moment and dipole moment. **10**  
 (b) Discuss in detail eddy current and hysteresis losses. **10**
4. What do you understand by diffusion and transition capacitance of P-N junction ? Briefly explain the operation of P-N junction. **20**
5. Describe the construction and working of the following : **10**  
 (i) LED  
 (ii) Solar-Cell.
6. (a) Differentiate between UJT and BJT. **10**  
 (b) Briefly explain the construction, working and applications of MOSFET. **10**
7. Briefly describe the construction and operation of the following using suitable schematics :  
 (i) Diac  
 (ii) GTO. **10+10**
8. Write short notes on the following :  
 (i) IGBT  
 (ii) Planar technology for device fabrication. **10+10**