

Total No. of Questions : 4]

SEAT No. :

PC387

[6359]-507

[Total No. of Pages : 2

**S.E. (Electrical Engineering) (Insem)**  
**MATERIAL SCIENCE**  
**(2019 Pattern) (Semester -III) (203142)**

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Attempt Q.No.1 or Q.No.2, Q.No.3 or Q.No.4.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data, if necessary.
- 4) Neat diagrams must be drawn wherever necessary.

**Q1) a)** Define following with their units: **[6]**

- i) Polarization
- ii) Polarizability
- iii) Susceptibility

b) Derive Clausius Mossotti equation & state its assumptions. **[5]**

c) Illustrate with diagram electrostriction & piezoelectric effect with its applications. **[4]**

**OR**

**Q2) a)** Explain following terms with units: **[6]**

- i) Loss tangent
- ii) Ferro electricity
- iii) Pyro electricity

b) Compare : polar & non polar materials. **[4]**

c) What is tan delta? Explain dielectric loss & derive equation for dielectric loss. **[5]**

*P.T.O.*

**Q3) a)** Describe measurement of flux density with Gauss meter. What is the principle of operation of Gauss meter? [7]

b) With neat circuit diagram & phasor diagram, explain measurement of dielectric loss angle ( $\tan \delta$ ) by Schering Bridge as per IS 13585-1994 [8]

**OR**

**Q4) a)** Explain the method of finding dielectric strength of air using sphere gap voltmeter with a neat diagram as per IS. [7]

b) Define Primary Ionization Coefficient and Secondary Ionization Coefficient. [4]

c) Define Dielectric Loss and loss tangent [4]

