

Roll No.

23291

**M. Tech. 2nd Semester (Electrical Engg.)
Specialization : Electrical Power Systems
(Elective-II)**

Examination – December, 2014

INSULATION TECHNOLOGY

Paper : MTEPS-205 (ii)

Time : Three Hours]

[Maximum Marks : 100

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

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

1. Explain following : 20
 - (a) Elemental dielectrics,
 - (b) Ionic dielectrics,
 - (c) Solids with permanent dipole moments.
2. (a) Prove that the absorption of energy is proportional to the imaginary part of complex dielectric constant. 10

- (b) For a polar liquid, make a qualitative sketch of the real and imaginary parts of the dielectric constant at two temperatures as a function of the frequency of an applied radio frequency field. 10
3. (a) Explain the behaviour of gaseous dielectric in electric fields. 10
- (b) Explain : 10
- Streamer theory, breakdown in vacuum insulation.
4. Explain various breakdown mechanisms involving solid dielectric breakdown. 20
5. Explain various breakdown theories involved in commercial liquid dielectrics. 20
6. (a) What are insulation materials ? Differentiate between natural and synthetic inorganic insulation materials, give examples. 10
- (b) Describe the ageing and breakdown in composite dielectric due to partial discharge. 10
7. (a) What is non-destructive testing of insulating materials ? Mention their characteristics. 10
- (b) What are partial discharges ? Differentiate between internal and external discharges. 10

8. Write technical notes on :

10 × 2 = 20

- (i) Practical importance of permittivity.
 - (ii) Erosion electrochemical breakdown.
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