

Q.P. Code : 15407

(3 Hours)

[ Total Marks : 100

- N.B. :** (1) Question No.1 is compulsory.  
 (2) Attempt any **Four** out of remaining **six** questions.  
 (3) Assume suitable **data** and state it **clearly**.

1. (a) Explain various methods adopted for triggering of impulse generator. **10**  
 (b) In an experiment for determining the breakdown strength of transformer oil following observations are made . Determine the relationship between the gap spacing and the applied voltage of the oil. **10**

Gap spacing in mm	4	6	10	12
Breakdown voltage in KV.	90	140	210	255

2. (a) What is 'Cascaded Transformer'? Explain why cascading is necessary? With neat diagrams, explain a three stage cascaded transformer system. **10**  
 (b) Explain the stressed oil volume theory and suspended particle theory that explains breakdown in commercial liquid dielectrics. **10**
3. (a) Explain streamer theory of breakdown in air at atmospheric pressure. **10**  
 (b) What is partial discharge? Differentiate between internal and external discharges. **10**
4. (a) Explain how sphere gap measurement can be used to measure the peak-value of the voltage for the effect of voltage measurement. **10**  
 (b) In an experiment in a certain gas it was found that the steady state current is  $5.5 \times 10^{-8}$  A at 8 KV at a distance of 0.4 cm between the plane electrodes. Keeping the field constant and reducing the distance to 0.1cm results in a current of  $5.5 \times 10^{-9}$  A. Calculate Townsend's Primary Ionization coefficient. **10**
5. (a) Explain the resonant transformer in detail. Compare it with cascaded transformer. **10**  
 (b) Explain the treeing and tracking phenomenon occurring in solid dielectrics. **10**
6. (a) Describe various tests that are carried on 'Transformers' as per IS codes. **10**  
 (b) What do you understand by 'intrinsic strength' of a solid dielectric ? How does breakdown occur due to electrons in a solid dielectric ? **10**
7. Write short notes on: (Any Three) :- **20**
- Testing of bushings
  - Layout and Test facilities in HV testing laboratories.
  - Testing of overhead line insulators
  - Dielectric loss measurement.