BE - sem - VII - Rev — Electrical

HVE

27/5/15

Q.P. Code : 8516

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. **1** is **compulsory.**
(2) **Solve** any **four** questions from remaining **six** questions.
(3) Assume suitable data and state it clearly.
(4) Draw neat diagrams whenever necessary.

1. (a) Explain how a sphere gap can be used to measure the peak value of voltages. What are the parameters and factors that influence such voltage measurements ? **10**
   (b) Explain the Streamer theory of breakdown in air at atmospheric presure. **10**

2. (a) Explain breakdown mechanisms which is proposed to explain the breakdown in solid insulating materials. **10**
      (i) Electro - mechanical breakdown
      (ii) Failure due to treeing and tracking
      (iii) Thermal breakdown
   (b) Define and explain the following terms **10**
      (i) Statical time lag
      (ii) Formative time lag
      (iii) Overvoltage and impulse ratio
      (iv) Total time lag
      Draw suitable graph showing all the above terms i.e. the front of applied impulse voltage wave.

3. (a) With neat circuit diagram, describe the construction, principle of operation and application of Marx's Impulse Generator. **10**
   (b) Discuss in brief, the various methods of measuring high D.C. voltages. What are the limitations of each method? **10**

4. (a) Describe the various tests that should be carried out on "Insulator" and give a brief account of each test as per ISI codes. **10**
   (b) Explain Cockcroft - Walton voltage multiplier circuit to develop high d.c. voltages. **10**

5. (a) Define and explain the following key terms in non-destructive testing techniques? **10**
      (i) Discharge detectors
      (ii) Delectric constant
      (iii) Loss factor
      (iv) D. C. resistivity

(v) Bridge techniques
(vi) P.D. measurements.

(b) Write short note on : - H V Laboratory Layout, grounding and Shielding. 10

6. (a) Explain Generating voltmetres. 10
(i) Objectives
(ii) Schematic diagram (Rotating Vane type)
(iii) Principle of operation
(iv) Applications & Limitations

(b) With reference to conduction and breakdown in commercial liquids explain 10
(i) Suspended Particle Mechanism
(ii) Cavitation and Bubble Mechanism
(iii) Stressed oil volume mechanism

7. (a) Draw basic circuit of radio interference measurement. Explain its principle of operation and its application in high voltage testing laboratories. 10

(b) What is principles of operation of Resonant Transformer? How is it advantages over cascade connection transformers. 10
