Code :R7410207

R7

IV B.Tech I Semester(R07) Supplementary Examinations, May/June 2011
HIGH VOLTAGE ENGINEERING
(Electrical & Electronics Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks
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1. (a) How is transformer insulation divided ? Briefly indicate the insulation arrangement indicating the insulating materials chosen.
   (b) How is an electric stress/Electric field intensity controlled ?
2. (a) Explain the difference between photo-Ionization and photo-electric emission.
   (b) What is stressed oil volume theory ? How does it explain breakdown in large volumes of commercial liquid dielectrics.
3. (a) How does the internal discharge phenomenon lead to breakdown in solid dielectrics ?
   (b) What is thermal break down in solid dielectrics and how it is practically more significant than other mechanism ?
4. (a) Give the Marx circuit arrangement for multi stage inpulse generators. How is the basic arrangement modified to accommodate the wave time control resistances.
   (b) An impulse generator has 8 stages with each condenses rated for $0.16\mu f$ and 125kv. The load capacitor available is 1000PF. Find the series resistance and the damping resistance needed to produce $1.2/50\mu s$ its pulse wave. What is the maximum output voltage of the generator if the changing voltage is 120kv.
5. (a) Describe the generating voltmeter used for measuring high d.c voltages.
   (b) Design a peak reading voltmeters along with a suitable micro Ammeter such that it will be able to read voltage upto 100kv (peak). The capacitance potential devices available of the ratio 1000:1
6. (a) What are the causes for switching and power frequency over voltages ? How are they controlled its power systems ?
   (b) A 3-phase single circuit transmission line is 400 cm long. If the line in rated for 220kv and how the parameters R=0.1 ohm/km, L=1.26mH/km $C = 0.009\mu f/km$ and G=0. Find:
      i. Surge impedance
      ii. The velocity of propagation neglecting the resistance of the line. If a surge of 150kv and infinity long tail strikes at one end of the line. What is the time taken for the surge to travel to the other end of the line.
7. (a) Discuss the method of balanced detection for locating partial discharges in electrical equipment.
   (b) While doing studies on partial discharges its cavities of cylindrical disc of 1.0cm diameter and 1.0cm thickness, a cylindrical cavity of 1mm diameter and 1mm thickness is made at its centre. The discharge voltage measured across the specimen is 0.2v with senility of & 1pc/volt. What is the magnitude of change transferred from the cavity ? Take Er of the disc =2.5.
8. (a) What in operating duty cycle test on a surge Arrestor ? Why it is more significant than other tests ?
   (b) Explain any one method of measuring RIV of transmission line hardware with neat diagram.

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