Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 41011

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Seventh Semester

Electrical and Electronics Engineering

EE 6701 – HIGH VOLTAGE ENGINEERING

(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. Write the mathematical model for lightning.
2. What is the use of protective devices ?
3. Define Paschen's law.
4. Define uniform and non-uniform fields.
5. What is a tesla coil ?
6. What is cascaded transformer ?
7. How the stray effect is reduced in resistive shunt type of measurements ?
8. Explain the basic principle of hall generator.
9. What is the significance of power factor tests ?
10. What is meant by insulation co-ordination ?

PART – B (5×16=80 Marks)

11. a) Explain the different methods employed for lightning protection of over head lines. **(16)**

(OR)

b) i) Explain the different theories of charge formation in clouds. **(8)**

ii) Cloud discharge 15 coulombs with in 1.5 ms on to a transmission line during lightning. Estimate the voltage produced at the point of the stroke on the transmission line. (Assume surge impedance of the line as 350 Ω). **(8)**

12. a) Explain the breakdown mechanism involving in solid dielectrics breakdown. **(16)**

(OR)

b) i) Explain the Townsends criterion for a spark. **(8)**

ii) List out the problems caused by corona discharges. **(8)**

13. a) Explain with neat diagram the generation of high DC voltage using Vande-Graff generator. State the factors which limit the ultimate voltage developed. **(16)**

(OR)

b) Explain the Marx circuit arrangement for multistage impulse generators. How is the basic arrangement modified to accommodate the wave time control resistances ? **(16)**

14. a) Explain any two methods to measure high impulse current. **(16)**

(OR)

b) A Rogowski coil is required to measure impulse current of 8 KA having rate of change of current of 10^{10} A/sec. The voltmeter is connected across the integrating circuit which reads 8V for full scale deflection. The input to integrating circuit is from Rogowski coil. Determine the mutual inductance of coil, R and C for the integrating circuit. **(16)**

15. a) Explain the impulse testing procedure for insulators. **(16)**

(OR)

b) Explain the different high voltage tests conducted on bushings. **(16)**
