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# **Question Paper Code: 59303**

#### B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

#### Elective

## **Electrical and Electronics Engineering**

### 15UEE903- HIGH VOLTAGE ENGINEERING

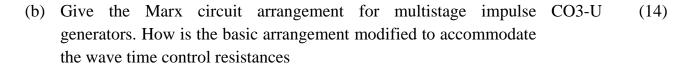
(Regulation 2015)

**Duration: Three hours** Maximum: 100 Marks **Answer ALL Questions** PART A -  $(5 \times 3 = 15 \text{ Marks})$ List the different types of over voltages on power system CO1-U Enumurate the properties required for a gaseous dielectric for HV application 2. CO2-R 3. State the necessity of generating high dc voltage. CO<sub>3</sub>- U CO4- U 4. Mention the factors influencing the measurements using sphere gap. CO5-U 5. Distinguish between flashover and puncture  $PART - B (5 \times 14 = 70 \text{ Marks})$ (a) State the mechanisms by which lightning strokes develop and CO1-U 6. (14)induce over voltages on overhead power lines. Give the mathematical models for lightning discharges and explain them (b) Mention the causes for switching and power frequency over CO1-Ana (14)voltages. How are they controlled in power system? (a) With neat sketch, Discuss the various mechanisms of vacuum break CO2-Ana 7. (14)down Or (b) Illustrate in detail about break down in commercial liquid dielectrics CO2-Ana (14)

(a) With a neat sketch, Illustrate about the working of a Van de Graff CO3-U

generator for producing very high voltages

(14)



9. (a) Describe the construction, principle of operation of a Generating CO4-U voltmeter and give its applications and limitations.

Or

- (b) (i) Construct with neat circuit diagram of capacitance potential CO4-U (10) transformer and explain its operation.
  - (ii) Discuss the merits and demerits of generating voltmeter method. CO4-U (4)
- 10. (a) (i) Explain the different types and nature of test conducted for CO5-U (7) (ii) Analyze in detail about the insulation coordination system. CO5-U (7) Or
  - (b) Mention the different power frequency tests done on insulators. CO5-U (14) Mention the procedure for testing.

$$PART - C (1 \times 15 = 15 Marks)$$

11. (a) A Cockcroft-Walton type voltage multiplier has eight stages with capacitances, all equal to 0.05 pF. The supply transformer secondary voltage is 125 kV at a frequency of 150 Hz. If the load current to be supplied is 5 mA,

Find

- (a) the percentage ripple,
- (b) the regulation, and
- (c) the optimum number of stages for minimum regulation or voltage drop.

Or

(b) Discuss how a sphere gap can be used to measure the peak value of CO3-U voltages with neat sketch. (15)