

International Islamic University Chittagong
Department of Electrical and Electronic Engineering

Final Examination Spring-2020	Program: B.Sc. Engg. (EEE)
Course Code: EEE-4807	Course Title: High Voltage Engineering
Time: 5 hours (Writing -4 hours 30 minutes + 30 minutes submission time)	Full Marks: 50 (Written 30 + Viva/Viva-Quiz-20)

[Answer **each of the** questions from the followings; Figures in the right margin indicate full marks. **Answer script must be submitted through online method within 5 hours from starting time. Also, write down the Q. Set on the front page of your answer script]**

Q. Set-A

1(a).	Why is controlled triggering required in an impulse generator? Explain the operation of a trigatron gap.	CO1	Cr	02
1(b).	A ten-stage impulse generator has 0.250 μ F condensers. The wave front and wave tail resistances are 75 ohms and 2600 respectively. If the load capacitance is 2.5 nF, determine , the wave front and wave tail times of the impulse wave.	CO1	Ev	01
1(c).	Starting from the basic Marx circuit develop the circuit of modern multistage impulse generator and briefly explain its operation.	CO1	Cr	03
2(a).	“Commercial liquid dielectrics are different from pure liquid dielectrics” Justify the statement.	CO1	Ev	01
2(b).	Explain how does ‘internal discharge’ phenomenon lead to breakdown in Solid dielectrics?	CO1	Cr	03
2(c).	A steady current of 600 μ A flows through the plane electrode separated by a distance of 0.5cm, when a voltage of 10KV applied. Determine , the Townsend’s first ionization coefficient if a current of 60 μ A flows when the distance of separation is reduced to 0.1cm and the field is kept constant at the pervious value.	CO1	Ev	02
3(a).	An absolute electrostatic voltmeter has a movable circular plate 8 cms in diameter. If the distance between the plates during a measurement is 4 mm, determine , the potential difference when the force of attraction is 0.2 gm in weight.	CO2	Ev	02
3(b).	Explain how a sphere gap can be used to measure the peak value of voltages?	CO2	Cr	02
3(c).	Design a peak reading voltmeter along with a suitable micro-ammeter such that it will be able to read voltages, up to 100 kV (peak). The capacitance potential divider available is of the ration 1000 : 1.	CO2	Cr	02
4(a).	What is meant by insulation co-ordination? How are the protective devices chosen for optimal insulation levels in a power system?	CO3	R, An	03
4(b).	Explain the procedure for constructing Volt-time curves with a neat sketch. Give , its significance in power system studies.	CO3	Cr, U	03

5(a).	What are the causes of switching and power frequency over voltages? How are they Controlled in power systems?	CO3	R, An	02
5(b).	Explain the lightning mechanism including leader and return stroke with the appropriate diagram.	CO3	Cr	02
5(c).	Derive a mathematical expression to locate a shunt surge arrestor for a protective device.	CO3	An	02
6.	Viva-Quiz: The time of viva-quiz will be declared in google classroom.	CO1	R	20