B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Sixth Semester

Electrical and Electronics Engineering

20EEEL602 - HIGH VOLTAGE ENGINEERING

Regulations - 2020

Duration: 3 Hours   Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)
Answer ALL Questions

		Marks	K–Level	CO
1.	What is the purpose of using corona rings in high voltage transmission lines?	1	K1	CO1
	a) To measure voltage b) To protect against lightning			
	c) To reduce corona discharge d) To increase corona discharge			
2.	For operating power frequency voltages, a surge arrester has to be a	1	K1	CO1
	a) Conductor b) Non-conductor c) Semiconductor d) None of these			
3.	Treeing phenomenon is observed in	1	K2	CO2
	a) Capacitors b) Cables c) Insulators d) Only (a) and (b)			
4.	According to the Bubble theory, once a bubble is formed, it will elongate in the direction of electric field under the influence of electrostatic forces. During elongation the volume of bubbles	1	K1	CO2
	a) Increases b) Decreases c) Remains constant d) None of these			
5.	What is the third winding in the transformer called?	1	K1	CO3
	a) primary winding b) secondary winding c) high voltage winding d) meter winding			
6.	What is the speed of the electric motor which drives the belt?	1	K1	CO3
	a) 10000-20000m/min b) 1000-2000m/min c) 10-20m/min d) 100-200m/min			
7.	Which is the simplest voltage doubler circuit?	1	K1	CO4
	a) Cockcroft-Walton b) Greinacher c) Cascaded and Cockcroft-Walton d) Cascaded			
8.	Which among the following diodes is preferred for high-voltage rectifiers?	1	K1	CO4
	a) Selenium diode b) Gunn diode c) Laser diode d) Silicon diode			
9.	Which insulating material is commonly used in high voltage cables?	1	K2	CO5
	a) XLPE (Cross-linked polyethylene) b) PVC (Polyvinyl chloride)			
	c) Wood d) Rubber			
10.	What is the tail time of switching impulse voltage according to Indian Standards?	1	K2	CO5
	a) 250 µs b) 50 µs c) 50 µs d) 2500 µs			

PART - B (12 × 2 = 24 Marks)
Answer ALL Questions

		Marks	K–Level	CO
11.	Write the types of transients.	2	K1	CO1
12.	What are the different types of over voltages?	2	K2	CO1
13.	Define breakdown voltage.	2	K1	CO2
14.	What are the two types of electrical discharges in gases?	2	K1	CO2
15.	Specify the rectifier circuits for producing high dc voltages from ac sources.	2	K1	CO3
16.	What is a tesla coil?	2	K1	CO3
17.	Mention the devices used to measure the D.C electric field strength.	2	K1	CO4
18.	Mention the techniques used in impulse current measurements.	2	K1	CO4
19.	What is a surge diverter?	2	K1	CO5
20.	Define type test.	2	K1	CO5
21.	Differentiate flashover and puncture.	2	K2	CO1
22.	Classify the types of tests conducted on high voltage apparatus.	2	K2	CO1

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **13878**

PART - C (6 × 11 = 66 Marks)
Answer ALL Questions

23. a) Derive the Townsend's first ionization coefficient and second ionization coefficient and obtain the criterion for breakdown.   *11   K3   CO1*

OR

    b) What are the causes for switching and power frequency over voltages? How are they controlled in power system?   *11   K3   CO1*

24. a) Explain the break down mechanisms of Cavitations & Bubble mechanism and Thermal mechanism of break down in commercial liquid dielectrics.   *11   K2   CO2*

OR

    b) Outline the various mechanisms of vacuum break down.   *11   K2   CO2*

25. a) Explain the different schemes for cascade connection of transformer for producing very high A.C voltages.   *11   K2   CO3*

OR

    b) Describe with a neat sketch the working of a Van De Graff generator. What are the factors that limit the maximum voltage obtained?   *11   K2   CO3*

26. a) Describe the generating voltmeter used for measuring high A.C voltages.   *11   K2   CO4*

OR

    b) Explain with neat diagram the principle of operation of an electrostatic voltmeter.   *11   K2   CO4*

27. a) With suitable diagram, explain the process of electrostatic precipitation.   *11   K2   CO5*

OR

    b) Discuss the role of High voltage engineering in electrostatic spinning.   *11   K2   CO5*

28. a) Explain the method of impulse testing of high voltage Transformers.   *11   K2   CO4*

OR

    b) Summarise the construction, principle of operation of a Generating voltmeter and give its applications and limitations.   *11   K2   CO4*