A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 99305

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2023

Professional Elective

Electrical and Electronics Engineering

19UEE905 – POWER QUALITY

(Regulations 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Voltage Sag is also called as CO1-U

   (a)Voltage Dip (b) Voltage Drop (c)Voltage rise (d) Nominal voltage

2. Which one is short duration voltage variation? CO1-U

   (a)Voltage sag (b) Voltage swell (c) Interruptions (d) All of these

3. What is the primary cause of voltage sags and interruptions? CO2-U

   (a) Lightning strikes (b) Power plant outages

   (c) Equipment faults (d) All of the above

4. How can the severity of voltage sag due to an induction motor starting be estimated? CO2-U

   (a) By measuring the power factor of the motor

   (b) By measuring the voltage drop across the motor terminals

   (c) By measuring the inrush current of the motor

   (d) By measuring the rotational speed of the motor

5. What is the primary purpose of lightning protection measures in power systems? CO3-U

   (a) To prevent the occurrence of lightning strikes

   (b) To mitigate the damage caused by lightning strikes

   (c) To reduce the frequency of lightning strikes

   (d) To eliminate the risk of over voltages caused by lightning strikes

6. What is ferro resonance? CO3-U

(a) A type of overvoltage caused by lightning strikes

(b) A type of overvoltage caused by capacitor switching

(c) A type of overvoltage caused by ground faults

(d) A type of overvoltage caused by electromagnetic interference

7. IEEE – 519 is the standard for CO4-U

(a) Voltage harmonies (b) Current harmonies

(c) spikes (d) sags

8. The devices for controlling harmonic distortions are CO4-U

(a) Line reactor (b) capacitor banks (c) zigzag t/f's (d) All the above

9. Instruments in the disturbance analyser category have very limited to CO5-U

(a) Harmonic study (b) Harmonic injection

(c) Harmonic analysis capabilities (d) any of the above

10. Voltage magnitude and transient magnitude can be measures by CO5-U

(a) Spectrum Analyze (b) Harmonic Analyzer

(c) Disturbance Analyze (d) RMS meter

PART – B (5 x 2= 10Marks)

11. How an oscillatory transient occurs. CO1-U

12. Illustrate the performance of a system in regard to voltage sag be estimated. CO2-U

13. Outline the function of line arresters in lightning protection? CO3-U

14. Mention the harmonic effects on devices and loads. CO4-U

15. List some of the major power quality monitoring equipment. CO5-U

PART – C (5 x 16= 80Marks)

16. (a) List the problems associated with waveform distortion and explain how they occurs? CO1-U (16)

Or

(b) Summarize various categories of power quality problems. CO1-U (16)

17. (a) Discuss the effects of voltage sag and interruption on various electrical equipment CO2-App (16)

Or

	(b)	Compare the effectiveness of different mitigation techniques for voltage sags, including active series compensators, static transfer switches, and fast transfer switches.	CO2 -App	(16)
18.	(a)	Analyze the capacitor switching, lightning, and ferro resonance cause over voltages, and measures can be taken to prevent or reduce the damage caused by these events?	CO3 -Ana	(16)
		Or		
	(b)	Analyze the working of the following device on over voltage Low pass filters. (i) Power conditioners. (ii) Surge filters.	CO3- Ana	(8) (8)
19.	(a)	(i) Explain briefly how the phenomena of current distortion affects the voltage distortion under the presence of harmonics.	CO1- U	(8)
		(ii) Explain briefly about locating harmonic sources and characterization in power system	CO1- U	(8)
		Or		
	(b)	Explain the devices used for controlling harmonic distortion and explain their function	CO1- U	(16)
20.	(a)	Briefly discuss the common objectives of power quality monitoring.	CO5- U	(16)
		Or		
	(b)	(i) Explain the various instruments used for power quality measurements.	CO5 -U	(8)
		(ii) Illustrate the factors to be considered when selecting the instruments?	CO5 -U	(8)

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