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Question Paper Code: 59318

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

Elective

Electrical and Electronics Engineering

15UEE918 – POWER QUALITY

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Which one of the following is not a type of Harmonic Distortion ? CO1- R
(a) Overvoltage (b) Harmonics (c) DC Offset (d) Noise
- The long-duration voltage variation is considered a sustained interruption, when the supply voltage has been zero for a period of time in excess of CO1- U
(a) 2 minute (b) 1 minute (c) 3 minute (d) 10 minute
- What is the transfer rate of fast transfer switch? CO2-R
(a) 1 electrical cycles (b) 2 electrical cycles
(c) 3 electrical cycles (d) 4 electrical cycles
- Which Equipment is sensitive to both the magnitude and duration of a voltage sag? CO2- U
(a) Under voltage relays (b) Motor drive controls
(c) Automated machines (d) None of the options
- Common indicators of ferroresonance are CO3- U
(a) Audible noise (b) Overheating (c) Flicker (d) All of the above

6. Shunt Capacitors supply _____ at the bus to which they are connected. CO3- U
- (a) Active power (b) Reactive power (c) Apparent power (d) None of the above
7. Harmonics of order $h= 5, 11, 17, \dots$ are generally CO4- U
- (a) Positive sequence (b) Negative sequence
(c) Zero sequence (d) None of the options
8. Which standard governs harmonic limits? CO4- R
- (a) IEEE 519-1992 (b) IEEE 819-1998 (c) IEEE 519-1998 (d) IEEE 819-1992
9. Which equipment is used to measure power quality? CO5- U
- (a) Disturbance analyzers (b) Flicker meters
(c) Energy monitors (d) All of the above
10. Power interruptions remote from the monitoring location will result in CO5- U
- (a) Very abrupt change in the voltage (b) Decaying voltage
(c) No change in the voltage (d) All the options are correct.

PART – B (5 x 2= 10 Marks)

11. Compare Overvoltage and Under voltage. CO1- U
12. List the causes of Voltage Sag. CO2- R
13. Identify the Power quality problems associated with lightning. CO3 -App
14. How harmonic sources are located? CO4 -App
15. Classify the instruments used for Power quality measurement. CO5 -Ana

PART – C (5 x 16= 80Marks)

16. (a) Explain in detail about CO1- U (8)
- (i) Long-Duration Voltage Variations.
- (ii) Short-Duration Voltage Variations. CO1- U (8)
- Or
- (b) Explain in detail about the types of waveform distortion. CO1- U (16)

17. (a) Explain the methodology of estimating Voltage sag performance. CO2- Ana (16)
- Or
- (b) Explain in detail about a device that can boost the voltage by injecting a voltage in series with the remaining voltage during a voltage sag condition. CO2- Ana (16)
18. (a) Explain in detail about the devices used for Overvoltage Protection. CO3- U (16)
- Or
- (b) Explain in detail about the computer tools used for transient analysis. CO3- U (16)
19. (a) Explain how Commercial and Industrial loads are responsible for harmonic distortion. CO4- U (16)
- Or
- (b) Explain in detail about the devices used for controlling harmonic distortion. CO4- U (16)
20. (a) Analyse the role of Expert systems in Power quality Monitoring. CO5- Ana (16)
- Or
- (b) Explain the working of flicker meter with necessary diagrams. CO5- Ana (16)

