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Question Paper Code: 59318

B.E. / B.Tech. DEGREE EXAMINATION, JUNE 2022

Elective

Electrical and Electronics Engineering

15UEE918 – POWER QUALITY

(Regulations 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Which of the following contribute to the low voltage and poor power factor CO1- R
(a) Reactive Power (b) Harmonics (c) Load Imbalance (d) All of the above
- A Source for inter harmonics are CO1- U
(a) Arcing load (b) Fluorescent lamp (c) Battery charger (d) UPS
- Equipment sensitivity to voltage sags is very much dependent on CO2-R
(a) specific load type (b) control settings (c) applications (d) All the above
- What is the cause for Voltage swell? CO2- U
(a) Capacitor (b) Lightning (c) Both A & B (d) None of the above
- The lightning arrester acts as CO3- U
(a) Surge reflector (b) Surge absorber (c) Surge coil (d) Surge diverter
- Isolation transformer is used for CO3- U
(a) Thermal protection (b) over voltage protection
(c) Fault analysis (d) None of the above
- Harmonics cause which of the following: CO4- U
(a) Heating in windings (b) Nuisance Tripping
(c) Capacitor Failure (d) All the above

8. The third harmonic currents are known as _____ CO4- R
 (a) Negative sequence harmonics (b) Zero sequence harmonics
 (c) Positive sequence harmonics (d) None of the above
9. Continuous and rapid variations in the load current magnitude which causes voltage variations CO5- U
 (a) Voltage distortion (b) Flicker
 (c) Voltage sag (d) Harmonics
10. Which one is a flicker source CO5- U
 (a) Arc furnaces (b) Welding machines
 (c) Wind turbines (d) All the above

PART – B (5 x 2= 10 Marks)

11. Differentiate between Sag and Swell CO1- U
12. Identify the reason for voltage sag while starting an electric motor? CO2- U
13. What are the devices used for over voltage protection?. CO3 -U
14. What are the effects of harmonic in power system? CO4 -U
15. What are the types of instruments available for measuring the power quality? CO5 -U

PART – C (5 x 16= 80Marks)

16. (a) Explain in detail the short duration and long duration voltage variations. CO1- U (16)
- Or
- (b) Imagine a situation that lightning falls on one of the three phase overhead live conductor. What problem will occur? Explain in detail CO1- U (16)
17. (a) Compare static transfer switch and fast transfer switch and choose an appropriate switch for power transfer between two sources CO2- App (16)
- Or
- (b) Compare and contrast different methods of protection of cable? CO2- App (16)
18. (a) Select an appropriate mitigation techniques for over voltages in power system and explain in detail CO3- App (16)
- Or
- (b) Make use of PSCAD / EMTP in analyzing the power quality problems CO3- App (16)

19. (a) Explain briefly about the phenomena of how current distortion affects the voltage distortion under the presence of harmonics CO4- U (16)
Or
(b) Discuss the various devices for controlling harmonic distortion? CO4- U (16)
20. (a) Explain the modern power quality monitors. Draw and explain the functional structure of expert systems CO5- U (16)
Or
(b) Explain the steps involved in power quality monitoring. CO5- U (16)

