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B.Tech.(EE) (2011 Onwards E-III)
B.Tech.(Electrical & Electronics) (2011 & 2012 Batch E-III)
(Sem.-7,8)

POWER QUALITY MONITORING AND CONDITIONING

Subject Code : BTEE-805A

M.Code : 71942

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Answer briefly :**
- What are the problems of motor starting due to voltage sag?
 - What type of starters must be used to eliminate voltage sag effects?
 - Write a note on: Instrumentation for power monitoring.
 - What is difference between rms and average value?
 - What do you understand by duration and retained voltage?
 - What are odd and even harmonics?
 - Assume that the RMS value of the third harmonic current in a nonlinear load is 20A, the RMS value of the fifth harmonic current is 15A, and the RMS value of the fundamental is 60 A. Calculate what is the individual third harmonic distortion.
 - Define the terms blackout and outage.
 - What is Fourier analysis?
 - What is difference between THD and individual harmonic distortion?

SECTION-B

2. What is power quality? Define the following terms with example :
 - a. Voltage sag
 - b. Voltage swells
 - c. Flicker
 - d. Transients
 - e. Voltage imbalance
 - f. Interruptions
 - g. Harmonics
3. What is difference between CBEMA and ITIC curves?
4. What are the different sources which generates harmonics? Explain with diagram how nonlinear load generates current in neutral.
5. Based on the output of a harmonic analyzer, it has been seen that a nonlinear load has a total RMS current of 80A .it also has 36,20,4.6 and 3.5A for the third, fifth, seventh and ninth harmonic currents, respectively. The instruments used have been programmed to present the result data in amps then in percentage. Based on the given information, determine the following
 - a. The fundament current in amps
 - b. The amounts of the third, fifth, seventh, and the ninth harmonic currents in percentage
 - c. The amount of the THD
6. What is effect of harmonics on motors and transformers? How harmonics effect in telecommunications?

SECTION-C

7. What is power quality monitoring? What is the necessity of power quality monitoring?
8. What is a filter? How we can classify them? What is difference between active and passive filters?
9.
 - a. What is the need of power quality standards? What are different standards associated with harmonics?
 - b. What are the different criterions to select a filter for a particular site?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.