Exam.Code:1019
Sub. Code: 7467

2063

M.E. Electrical Engineering (Power System)

Third Semester

EE-8304a: Power Quality Problems and Mitigation

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt <u>any five</u> questions.

x-x-x

Q1. A) Write and discuss the various IEEE and IEC power quality standards in details. **(05)**

B) Discuss the three phase three wire and three phase for wire system and their role in power quality with suitable illustrations. **(05)**

Q2. A) Discuss the source and effects of different categories of long duration voltage variations that affect the power quality. **(05)**

B) Summarize the impact of poor power quality on utility and consumers. **(05)**

Q3. Consider a waveform contain 60 Hz fundamental plus 3^{rd}, 5^{th}, 7^{th}, 9^{th} and 11^{th} harmonics with their magnitudes being reciprocal of their harmonics numbers. Determine and formulate THD and DIN. **(10)**

Q4.A) What are the limitations of the shunt compensation using lossless passive components? **(05)**

B) Compare the difference between Transient Voltage Surge Suppressors (TVSS) and surge arrestors. **(05)**

Q5. A) What are the various lightning protection schemes used for over voltage lines? **(05)**

B) Illustrate the phenomena of impulsive transients and oscillatory transients. **(05)**

Q6(A) Explain the function of active filters and how it overcomes the drawbacks of passive filter in controlling harmonic. **(05)**

B) Explain the harmonics effects on the power system equipments briefly. **(05)**

Q7. A) Explain the operation of Distribution Static Compensator (DSTATCOM) used for sag mitigation. **(05)**

B) A single-phase transformer is used to feed a single-phase diode bridge rectifier with constant DC load current of 100 A. The transformer has been rated for a winding eddy current loss density of 10% (0.1 pu). Calculate its derating factor. **(05)**

Q8. Write short notes on the following: (i) Low pass filters (ii)Power conditioner **(10)**

x-x-x