GUJARAT TECHNOLOGICAL UNIVERSITY

Sul	hiect	ME - SEMESTER–IV • EXAMINATION – SUMMER 2015 Code: 744201 Date: 01/05/2015	
Sul	bioct	Nama [•] Harmonics Elimination Tachniques	
Time: 2:30 pm to 5:00 pm Total Marks: 70			
Inst	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a) (b)	 Distinguish between linear and non linear loads. Give their examples. Define the following terms. (1) Total Harmonics Distortion (2) Total Demand Distortion (3) Telephone Influence Factor (4) C Message Index (5) K factor (6) Total Power Factor (7) Displacement Power Factor 	07 07
Q.2	(a)	Explain how harmonics cancellation is obtained through the use of multi pulse	07
	(b)	converter with necessary sketches and waveforms. Discuss harmonic distortion limits for voltage and current in conformance with IEC limits.	07
	(b)	OR Discuss harmonic distortion limits for voltage and current in conformance with IEEE 519:1992.	07
Q.3	(a) (b)	Describe in brief effects of harmonics on transformer. Explain the producer for the design of single tuned filter with design equation for harmonic elimination. Also discuss its quality factor. OR	07 07
Q.3	(a) (b)	Explain pulsating torques in rotating machines. Explain the concept of parallel resonance with respect to harmonic elimination.	07 07
Q.4	(a)	Draw a neat schematic of Dynamic Voltage Regulator and working of the same with respect to hormonic reduction	07
	(b)	Explain PWM converter topologies for three phase four wire shunt active filter with necessary block diagrams.	07
Q.4	(a)	OR Explain working of shunt active filter for constant power compensation. Draw the block diagram for constant instantaneous power control strategy and explain its working	07
	(b)	Giving circuit diagram, explain the working of series active filters. Also discuss the algorithm used to generate compensated voltage signals.	07
Q.5	(a)	Draw & explain functional block diagram of the Unified Power Quality Controller (UPOC).	07
	(b)	Explain interrelation between AC system and load parameters for industrial installations.	07
05	(a)	OR Harmonic currents and their propagation to distribution network with diagram	07
Q.3	(a) (b)	 With respect to harmonic measurement explain: 1. How to carryout measurements 2. How long should measurements last 	07 07