Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2180911 **Date: 04/05/2017**

Subject Name: Power Quality and Management(Departmental Elective - III)

Time: 10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define and describe following terms: (1) Linear loads (2) Inrush current (3) Voltage Swell (4) Notch.	**07**
	(b)	What is harmonic? Give classification of it according to their rotating phase sequences. Explain its effect on operation of induction motor.	**07**
Q.2	**(a)**	Define flicker. List reasons responsible for flicker. Also state its effects. If a voltage in a circuit floats between 225 V to 235 V, find the frequency of flicker.	**07**
	(b)	What is an ITIC graph? Draw and discuss the ITIC graph in detail.	**07**
		OR	
	(b)	What is an electromagnetic interference? Explain various EMI mitigation techniques in detail.	**07**
Q.3	**(a)**	Load current of a non linear load has following components. RMS value of fundamental, 3rd, 5th and 7th harmonics are 50A, 20A, 15A and 10A respectively. Find individual harmonic distortion as per IEEE. Also find THD of the current. If this current is supplied by a transformer then find the value of k factor for transformer.	**07**
	(b)	Define transient. Discuss "switching of loads" and "interruption of fault currents" as causes of transients.	**07**
		OR	
Q.3	**(a)**	List and explain various loads which are responsible for introduction of harmonics in the system.	**07**
	(b)	Explain effect of harmonics on (1) transformers and (2) capacitor banks.	**07**
Q.4	**(a)**	Define, displacement power factor and true power factor .List the methods of power factor improvement techniques and explain the static VAR Compensator.	**07**
	(b)	Explain single point & multi point grounding.	**07**
		OR	
Q.4	**(a)**	Explain following terms related to EMI. (1) Common Mode Noise (2) Common Mode Rejection Ratio (3) Conducted Emission.	**07**
	(b)	With a case study explain the fatal effect which may result due to loss of Grounding.	**07**
Q.5	**(a)**	Define the term "Distribution Generation". Discuss the various DG technologies in brief.	**07**
	(b)	List and explain various power quality issues affected by "Distributed Generation".	**07**
		OR	
Q.5	**(a)**	Explain the main steps to monitor the power quality problems at site.	**07**
	(b)	Write short note on importance and application of (1) true RMS meter and (2) transient disturbance analyzers.	**07**

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