Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER IV (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2740704 **Date:04/05/2016**

Subject Name: Power Quality

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)**	Explain the cause and effect with respect to power quality point of view? What is an immunity of the equipment? Discuss the treatment criteria for a machine.	**07**
	(b)	Explain following terms: Bonding, Impulse, Transient, Surge, Inrush, Interruption, Sag.	**07**
Q.2	**(a)**	What is an arc furnace? Explain with suitable diagrams arc furnace can produce large voltage sags in electrical network. Also explain starting/stopping of capacitors banks in conjunction with an arc furnace operation.	**07**
	(b)	What are CBEMA and ITIC graphs? Draw and discuss the ITIC graph in detail	**07**
		OR	
	(b)	Discuss induction motor starting problem due to voltage sag with suitable example and waveform.	**07**
Q.3	**(a)**	Explain (i) Atmospheric phenomena and (ii) Switching of capacitor banks, which creates the transients in power systems.	**07**
	(b)	Explain cause of voltage and current Harmonics.	**07**
		OR	
Q.3	**(a)**	Define Displacement power factor and True power factor. List the methods of power factor improvement techniques and explain the static VAR Compensator also state the advantages of power factor corrections.	**07**
	(b)	Discuss “switching of loads” and “interruption of fault currents” as causes of Transients	**07**
Q.4	**(a)**	What is harmonic? Give classification of it according to their rotating phase sequences.	**07**
	(b)	What are the power quality standards? Discuss responsibilities of supplier and user of electrical power with respect to power quality	**07**
		OR	
Q.4	**(a)**	What is the importance of the value of earth’s resistance? Describe the fall of potential methods for measurement of earth’s resistance.	**07**
	(b)	With a case study explain the fatal effect which may result due to loss of Grounding	**07**
Q.5	**(a)**	What is an electromagnetic interference (EMI)? Discuss the essential elements of EMI.	**07**
	(b)	Explain signal reference grounding with typical computer and communication facility data center grounding and bonding.	**07**
		OR	
Q.5	**(a)**	Explain various EMI mitigation techniques in detail	**07**
	(b)	Which are power quality measurement devices? Discuss about number of test locations & test duration for power quality measurement.	**07**

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