

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2180911

Date: 10/11/2017

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

Time:02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

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

		MARKS
Q.1	(a) State the importance of Power Quality in recent times.	03
	(b) Discuss responsibilities of suppliers and users for Power Quality.	04
	(c) List cures for low frequency disturbances. Explain any two.	07
Q.2	(a) What is voltage sag? List reasons responsible for it.	03
	(b) Explain flicker. Also give its equation.	04
	(c) Explain transient model of power system for low frequency.	07
	OR	
	(c) With necessary diagrams and derivations explain the transient response of capacitor when DC voltage is applied.	07
Q.3	(a) How atmospheric conditions are responsible for transients in power system?	03
	(b) Find the THD and IHD as per IEEE standards for the supply having following details. Also find IHD of 3 rd harmonics as IEC standard. Fundamental= $V_1 = 224V$ 3 rd harmonic = $V_3 = 8V$ 5 th harmonic = $V_5 = 4V$	04
	(c) List and explain types of harmonics based on the sequence of rotation. Also discuss the effect of each.	07
	OR	
Q.3	(a) A 100kW Induction motor is working at 0.7 power factor. If the power factor is to be improved to 0.95 with capacitors, how much shunt capacitor in kVAR is needed?	03
	(b) What do you mean by order of harmonics? When even order harmonics will be present in the system? Explain its effect on induction motor.	04
	(c) List and explain various harmonic mitigation techniques.	07
Q.4	(a) Draw main service switchboard indicating elements of a grounded system.	03
	(b) With the help of a case study explain how ground noise causes adjustable speed drives to shut down.	04
	(c) Discuss about power system grounding & bonding schemes.	07
	OR	
Q.4	(a) State the importance of power factor in industry as per power quality study.	03
	(b) Define (i) radiated emission (ii) Attenuation (iii) Common mode noise (iv) transverse mode noise	04
	(c) What is EMI? Explain about power frequency fields in detail.	07
Q.5	(a) Explain the use of data loggers and chart recorders for Power Quality improvement.	03

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| | (b) | List and explain advantages and disadvantages of Distributed Generation. | 04 |
| | (c) | How test location and duration is important for Power Quality analysis? Explain with case study. | 07 |
| | | OR | |
| Q.5 | (a) | List various sources of EMI. | 03 |
| | (b) | Describe phenomena of islanding. | 04 |
| | (c) | Explain operating conflicts associated in interference with relaying in distributed generation. | 07 |
