Hall Ticket Number:

Code No. : 21717

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

M.E. (EEE: CBCS) I-Semester Main Examinations, January-2019

(Power Systems & Power Electronics)

Power Quality Engineering

Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Q.No.	Stem of the question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	Distinguish between spectrum analyzer and harmonic analyzer.	2	1	1	1,2
2.	How is flicker caused?	2	1	1	1,4
3.	How is critical distance to fault evaluated for a given magnitude of sag?	2	2	2	2,4
4.	What is the effect of transformer on sag magnitude?	2	3	3	4
5.	What are the various circuits that can be implemented for ac to dc conversion in various power electronic equipment?	2	3	3	3
6.	Explain why DC link capacitor is used in an AC drive.	2	2	3	3
7.	What are the problems experienced by communication systems due to harmonics in power systems?	2	3	3	1,2
8.	How do non linear loads affect power quality?	2	4	2	2,4
9.	What are the merits and demerits of ungrounded systems?	2	2	2	4
10.	What is resistance grounding and why is it used?	2	2	1	3
	Part-B (5 × 8 = 40 Marks)				
11. a)	Discuss how power interruption can be considered to be a power quality issue.	4	4	2	3
b)	What are the effects of harmonics on motors?	4	5	3	2
12. a)	Explain why high impedance faults cause large negative phase angle jumps?	4	4	3	2
b)	Explain behavior of induction motor during sag.	4	2	3	4
13. a)	Derive an expression for drop in speed of an AC drive during brief sag in voltage.	4	2	2	1,2
b)	Explain the effect of phase angle jump on the performance of DC drive	4	5	1	4
14. a)	Distinguish between harmonics and transients	4	2	1	2
b)	How do single phase power supplies contribute to harmonics?	4	3	1	3
15. a)	Distinguish between grounding and bonding.	4	3	1	3
b)	What are the various reasons for grounding?	4	3	3	4
16. a)	What are interharmonics and how they are caused?	4	2	2	1
b)	What are various issues of power quality?	4	2	1	2

Contd... 2

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17. Answer any ***two*** of the following:				
a) Derive an expression time to trip of a Variable Frequency Drive (VFD) during voltage sag conditions. How is it affected by under voltage setting of VFD?	4	2	3	3
b) What are triplen harmonics and how are they eliminated?	4	2	3	4
c) How do nonlinear loads affect power quality?	4	2	2	1,2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	60%
2	Knowledge on application and analysis (Level-3 & 4)	30%
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	10%